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The development of radio station KRJC at Modesto Junior College

Edward L. McClarty
University of the Pacific

THE DEVELOPMENT OF RADIO STATION KRJC AT MODESTO JUNIOR COLLEGE

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This thesis is a report of the development of campus radio station KRJC. Many people have helped considerably in the development of the station. This thesis could not be written without mention of those who have contributed so much to the inception and growth of the station.

For assistance in this project I express my sincere thanks to the following:

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My Modesto Junior College radio students, whose enthusiasm has constantly provided the motivation to improve and expand KRJC.

I am sincerely appreciative of the help given by radio engineer Cecil Lynch, General Manager of KBOX. He designed and tested the very excellent KRJC transmitter. He also gave freely of his time and equipment to test radiation patterns on and off the campus. His suggestions for KRJC experiments and projects have proved very valuable. His many hours of hard work for the development of a realistic radio curriculum at Modesto Junior College have to a very large extent made KRJC possible.

Ed McClarty
April 11, 1951

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CHAPTER I

INTRODUCTION

This thesis is designed to present clearly the facts of significance and interest which have led to the development of KRJC, the student-operated campus radio station at Modesto Junior College, Modesto, California. This study explains the theory and regulations of "carrier-current" transmission; a brief historical sketch of the radio curriculum at Modesto Junior College is given; the KRJC transmitter and other important station equipment are described; the organization of KRJC is described and analyzed; a concise chapter presents a summary of findings and recommendations.

There was a two-fold need for this study: the findings would be of historical value to Modesto Junior College, and the thesis would provide a valuable outline of possibilities and procedures for other educational institutions.

KRJC is not to be considered a finished project, and therefore, the research contained in this report attempts only to describe the factors which have led to the development of KRJC up to February 1, 1951.

Many colleges and universities throughout the United States have constructed radio broadcasting facilities based on the same electronic principles which make KRJC possible. These stations are identified by several terms which have

been used synonymously by college broadcasters: "gas pipe station", "carrier-current station", "wired-wireless station", and "campus station." In this thesis the writer will consistently use the term "carrier-current station." In directly quoted sections other terms may be used to identify the carrier-current station, and when this is done the writer will insert "carrier-current station" within brackets immediately following the term used by the person who is quoted.

The ultimate objective of this study is to organize and present all important data relative to the organization and development of KRJC at Modesto Junior College.

CHAPTER II

THEORY AND REGULATIONS CONCERNING CARRIER-CURRENT STATIONS

This chapter will explain the basic electronic principles of carrier-current transmission and the rules and regulations of the Federal Communications Commission as they apply to carrier-current stations.

De Soto has written about the electromagnetic phenomenon of limited radiation devices.[1] The carrier-current station is a limited radiation device, and De Soto's discussion and conclusions provide an excellent explanation of the theory and functioning principles of the carrier-current station.

When a radio station is broadcasting, it is sending power to its transmitting antenna, and two different electromagnetic fields are set up around the antenna. One of these is the radiation field, and the energy in this field leaves the transmitting antenna and travels into space. The other is the induction field; its energy goes into space and then returns to the transmitting antenna. In conventional radio broadcasting, the radiation field is the one which travels to the antennas of radio receivers, and the induction field is of no importance.[2]

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[1] Clinton B. De Soto, "The Field That Stays At Home", QST, 26:28-33, April, 1942.

[2] Loc. cit.

The carrier-current station is possible because of the existence and characteristics of the induction field.

An understanding of the distinction between the induction field and the radiation field will be gained from a review of the phenomenon of radiation. Consider a coil with direct current flowing in it. A magnetic field is set up around the coil. The field, with a strength depending on the magnitude of the current, extends into space for a certain distance. The field has a polarity which depends on the direction of the current flow.[3]

If the current traveling in the coil is instantaneously cut off, the magnetic field will collapse, and the energy in the field will return to the coil. If at the very instant the current stops flowing in one direction, it starts flowing again in the opposite direction with equal strength, an equal and opposite electric field will be set up before the original field can return to the coil. The original field is then unable to return home because the new field has forced it out, and the original field is thereby sent on a journey through space. The phenomenon of radiation is the successive detachment of one electrical field after another in a series of waves which develop with each reversal of current.[4]

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[3] Ibid., p. 29.

[4] Loc. cit.

In the ideal radiation system with instantaneous reversals of current, all of the energy in each field would be radiated, and none would return to the coil. The amount of energy which radiates and the amount which stays at home is largely determined by the number of current reversals per second. At audio and very low radio frequencies most of the energy succeeds in returning to the source and very little is radiated. At the higher radio frequencies, on the other hand, the cycles come along so rapidly that the electric field--even though it travels 186,000 miles per second--has little time in which to return to the source, and as a result most of it gets detached and is radiated into space.[5]

The part of the field that returns to the coil is the induction field; the part that is detached is called the radiation field.

The most obvious difference between the two distinct fields is that the radiation field is weaker than the induction field near the coil (transmitting antenna) and the stronger of the two fields at a distance from the coil. The relationship between the two fields is well illustrated in Figure I on page 6. De Soto's explanation of Figure I is concise and clear:

Fig. I -- The relationship between induction and radiation fields about a coil or loop antenna

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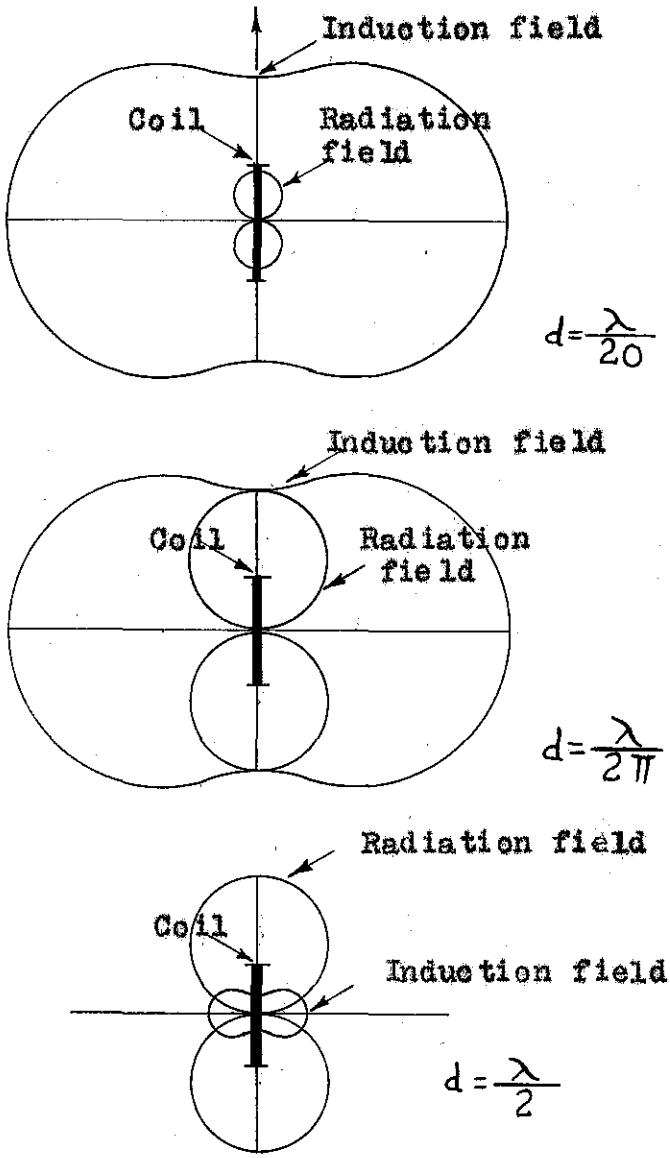
[5] Loc. cit.



THE RELATIONSHIP BETWEEN INDUCTION AND RADIATION FIELDS ABOUT A COIL OR LOOP ANTENNA AT VARIOUS DISTANCES.

FIGURE I

at various distances. Below each diagram the distance in terms of wavelength is indicated. At a point very near the coil $\left(\frac{\lambda}{20}\right)$ the induction field strongly predominates. At the distance $\frac{\lambda}{2\pi}$ (center) the two are equal in the plane of the loop. When the distance is a full half-wave (bottom) the radiation field is the stronger.[6]

The radiation field varies inversely as the distance from the coil, and the induction field varies inversely as the cube of the distance.[7]

If a radio receiving set is very close to the transmitting antenna of a broadcasting station, it is possible that it will receive energy from the induction field and the radiation field, and the set will respond to both fields as one.. Carrier-current stations are possible because the receiving sets are near a metal conductor of radio frequency energy.

Any additional discussion of carrier-current stations should be preceded by an analysis of the rules and regulations of the Federal Communications Commission which apply to this type of broadcasting. The rules are reproduced here in their entirety:

RULES GOVERNING RESTRICTED RADIATION DEVICES

15.1. General. Pending the acquiring of more complete information regarding the character and

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[6] De Soto, op. cit., p. 29.

[7] Loc. cit.

effects of the radiation involved, the following provisions shall govern the operation of the low power radio frequency electrical devices hereinafter described.

15.2. Apparatus excepted from requirements of other rules. With respect to any apparatus which generates a radio frequency electromagnetic field functionally utilizing a small part of such field in the operation of associated apparatus not physically connected thereto and at a distance of not greater than $\frac{157,000}{f\text{kc.}}$ ft. $\left[\lambda/2\pi\right]$, the existing rules and regulations of the Commission shall not be applicable provided:

(a) That such apparatus shall be operated with the minimum power possible to accomplish the desired purpose.

(b) That the best engineering principles shall be utilized in the generation of radio frequency currents so as to guard against interference to established radio services, particularly on the fundamental and harmonic frequencies.

(c) That in any event the total electromagnetic field at any point at a distance of $\frac{157,000}{f\text{kc.}}$ ft. $\left[\lambda/2\pi\right]$ from the apparatus shall not exceed 15 microvolts per meter.

(d) That the apparatus shall conform to such engineering standards as may from time to time be promulgated by the Commission.

15.3. Exceptions; interference to radio reception. The provisions of Section 15.1 and 15.2 shall not be construed to apply to any apparatus which causes interference to radio reception.

15.4. Inspection and test; certificates. Upon request, the Commission will inspect and test apparatus described in Section 15.1 and 15.2, and on the basis of such inspection and test, formulate and publish findings as to whether such apparatus does or does not comply with the above conditions, and issue a certificate specifying conditions of

operation to the party making such request.[8]

KRJC's correspondence with the Federal Communications Commission shows that the Commission will not inspect college carrier-current stations upon the request of the station and will not grant certificates of operation to these stations. Rule 15.4, Inspection and test; certificates, does not apply to college carrier-current stations; the rule does apply to carrier-current installations of industrial organizations, such as radio manufacturers or utility companies.

Sections 15.1 through 15.2 have been interpreted by the FCC officials to mean that the total electromagnetic field produced at any point a distance of $\frac{157,000}{fkc.}$ feet (In the denominator of this fraction, "fkc." stands for the frequency in kilocycles.) from the transmission lines and other transmitting media for radio waves should not exceed 15 microvolts per meter.[9]

A FCC press release, dated November 21, 1938, clarifies Section 15.2, paragraph (c) with the following footnote:

For wired-wireless [carrier-current] systems

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[8] Rules Governing Restricted Radiation Devices, Federal Communications Commission Rules and Regulations, Appendix "A", cited by Intercollegiate Broadcasting System, General Engineering Information for Building a Campus Station, October 6, 1948. p. 3.

[9] General Engineering Information For Building A Campus Station, Intercollegiate Broadcasting System, October 6, 1948. p. 1.

> the term apparatus is interpreted to mean the nearest point of the conductors carrying the radio frequency currents.[10]

For all carrier-current installations the measured field strength at a distance of $\frac{\lambda}{2\pi}$ meters or $\frac{157,000}{fkc.}$ ft. or $\frac{30}{fkc.}$ miles from the nearest conductor must not exceed 15 microvolts per meter. This distance, expressed in feet, is shown in Figure II, page 11, for radio frequencies recommended for college carrier-current stations. Examination of the equation for the maximum allowable radiation distance shows that this distance is greatest at the low frequency end of the broadcast band. For this reason most college systems operate on some clear broadcast band channel of 700 kilocycles or below. A clear channel must be chosen in order that the carrier-current station will not interfere with usable standard broadcast signals originating outside of the buildings covered by the carrier-current station.

It was stated earlier that carrier-current stations are possible because of the existence of two electromagnetic fields. This becomes apparent when the methods employed to carry radio frequency signals from the transmitter to all locations in buildings on campus are studied. Many differ-

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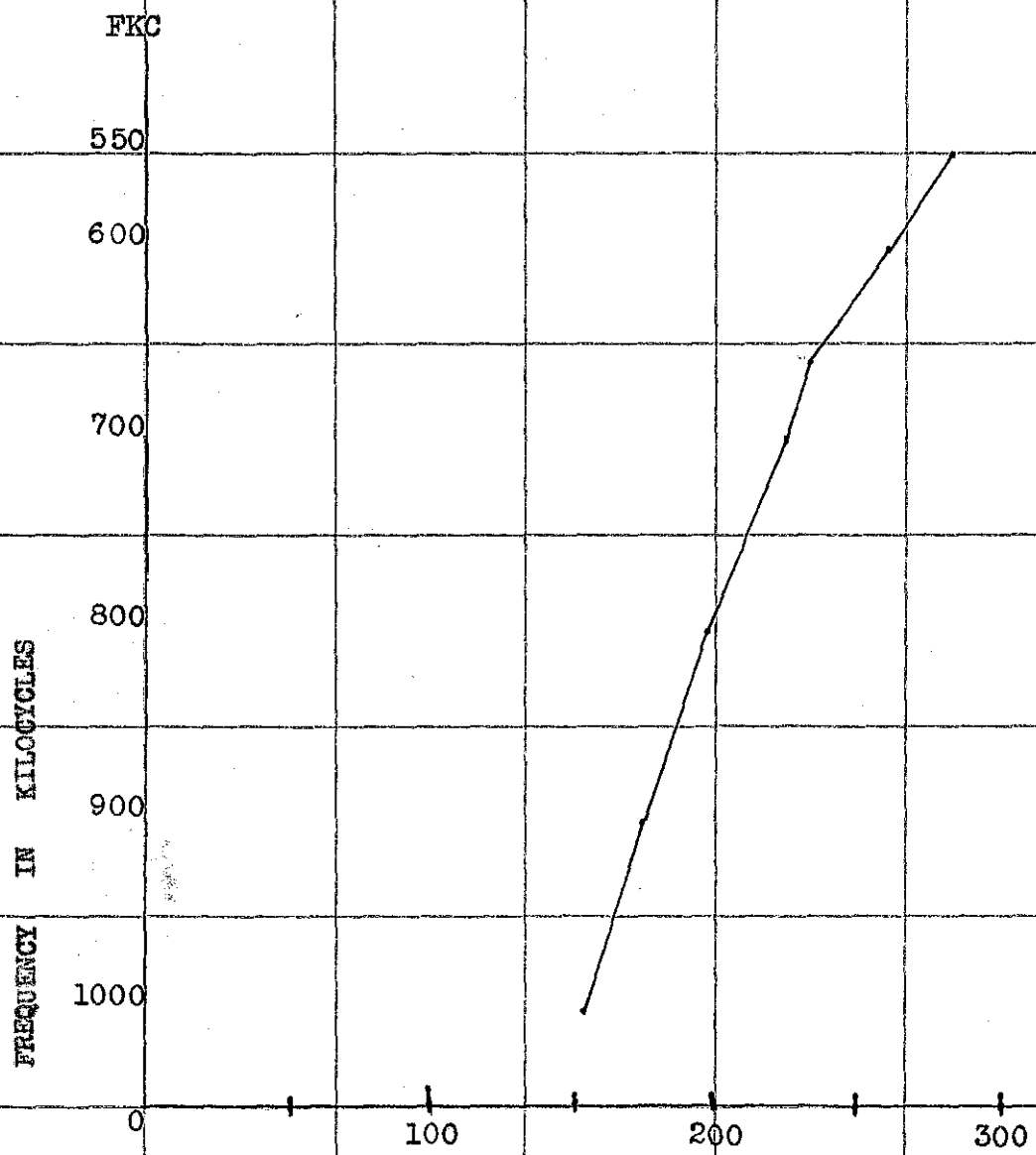
[10] Press Release of the Federal Communications Commission, November 21, 1938, cited by Intercollegiate Broadcasting System, General Engineering Information for Building a Campus Station, October 6, 1948. p. 2.



MAXIMUM DISTANCES IN FEET AT WHICH 15 MICROVOLTS PER METER FIELD STRENGTH IS PERMITTED UNDER FCC RULE 2.102 FOR FREQUENCIES SUGGESTED FOR COLLEGE CARRIER-CURRENT STATIONS.

FIGURE 2

ent types of systems are used to carry the radio frequency signals of carrier-current stations to receivers in living quarters or classrooms. Most carrier-current stations utilize the electric light wires within the dormitories and fraternities to conduct their signals to within very close proximity of the radios within the buildings. In some cases the heating pipes or the metal framework of the buildings have been used with success. The ultimate desire is to provide a conducting path from the transmitter to a point near each radio. The transmitter may be centrally located and connected to the buildings by a network of radio frequency lines, or it may be one of several individual transmitters placed around the campus. In the latter case each transmitter covers one or more buildings. Systems of radio frequency amplification have been used. Due to low power, non-resonant antennas, and the characteristics of the induction and radiation fields, radios near the radio frequency carrier (conductor) will receive an excellent signal and perform correspondingly. The radiation field strength is very weak near the carrier, and because it varies inversely as the distance from the source, proper design will prevent radiation greater than the rules of the Commission allow. In all cases, stray radiation from buildings and radio frequency lines must be kept below the level specified by the FCC.

In General Information Release 54846, dated October 24, 1941, the FCC stated:

> In the intercollegiate broadcasting systems, communication is effected not by the transmission of radio waves through space but by the transmission of radio frequency currents via wire lines. Radiation of energy from the lines capable of causing interference is prevented by proper shielding of the line in metal conduit. . .
>
> Preliminary investigations have indicated that these intercollegiate systems are well engineered and supervised. No interference has been reported as a result of their use. The Commission has therefore not promulgated any rules governing their operation.
>
> This type of system, however, if used on open lines or if improperly designed, is capable of causing very serious interference. The Commission is therefore making a study with a view to the need for regulation in the case of extension of this principle of communication to other fields.[11]

"In a more recent release dated January 3, 1947, the FCC reiterates the statement made above."[12]

If a carrier-current station adheres strictly to the rules and regulations of the Commission, there is no need for the station to secure a station license or licenses for its operators. At many places throughout the United States the FCC maintains monitoring stations to facilitate making routine checks or immediate investigations resulting from specific complaints or requests. Carrier-current

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[11] General Information Release 54846 of the Federal Communications Commission, October 24, 1941, cited by Intercollegiate Broadcasting System, General Engineering Information for Building a Campus Station, loc. cit.

[12] Loc. cit.

stations which are found not in compliance with the law are forced to close until remedial steps are taken and their effectiveness proved to a radio inspector of the Commission. During 1948 the FCC conducted field strength tests at six stations of the Intercollegiate Broadcasting System and found that the allowable radiation limit was being exceeded in various degrees at these institutions.[13]

The Intercollegiate Broadcasting System has described the steps taken by these carrier-current stations in order to correct their violations of the Commission's rules and regulations:

> These stations immediately took steps to reduce their radiation to within the allowable limits which they found they could readily accomplish by reducing the power in-put to their transmitters and employing good practice in the design of their RF [radio frequency] transmission lines. This experience served to emphasize the need for good design and careful operation of the RF radio frequency system of campus radio stations [carrier-current stations].[14]

The FCC has been conducting an extensive study of carrier-current stations, and a general hearing to determine the future status of these stations was held by the Commission in Washington, D.C., during the week of June 6, 1950. The writer has found no decisions which were released as an outgrowth of the hearing of June, 1950.

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[13] Loc. cit.

[14] Loc. cit.

In a letter of August 28, 1950, to the secretary of the Federal Communications Commission, KRJC requested an official assignment of call letters by the Commission. KRJC was informed in previous communications from the Commission that the call letters KMJC were unavailable for its use, and therefore the station sent a list of ten sets of call letters to the Commission for its consideration. KRJC was fifth on the list of suggested call letters, and in the Commission's answer of September 8, 1950, the station was advised that the call KRJC is being reserved for the Modesto Junior College campus system.

Evidence indicates that the Federal Communications Commission will cooperate with and support carrier-current stations of colleges and universities.

The practical applications of the theory and regulations of the carrier-current station will be discussed in Chapter V, The KRJC Transmitter and Other Important Equipment.

CHAPTER III

BRIEF HISTORICAL SKETCH OF THE RADIO CURRICULUM AT MODESTO JUNIOR COLLEGE

For the development of this chapter, the writer used three sources for data: (1) yearly catalogues of Modesto Junior College; (2) yearly college inventories of radio equipment; and (3) an interview with the college registrar.

Radio courses were first listed and described in the Modesto Junior College catalog of 1936. Public Speaking 61 and 62 were called broadcasting, and each course was valued at two semester units. Both the fall and spring courses were limited to twenty sophomores, and Public Speaking 62 had additional prerequisites: Public Speaking 61 and the consent of the instructor. The work of the first course included class discussions and readings from periodical literature on the principal phases of radio broadcasting. The production of radio programs and the appreciation of commercial and educational radio entertainment were studied in Public Speaking 61. Members of this class received practice in weekly broadcasts over KTRB, Modesto's only radio station. Public Speaking 62, as a continuation of 61, included the study of broadcasting standards, the techniques of announcing and producing radio programs, and advanced individual assignments in conducting

such programs.[1]

A change in the titles of radio courses was made in 1939-1940. Public Speaking 61 and 62 were described as Radio Workshop. The description of the courses remained essentially the same as it appeared in the catalogs of 1936, 1937 and 1938.[2]

In 1941-1942 Radio Workshop was listed under the Department of English and Speech and was labeled Speech 45 and 46.[3]

Radio Workshop became Speech 55 and 56 in 1942-1943.[4]

Radio courses were not listed in the Modesto Junior College Catalog of 1943-1944.[5] Speech 55 and 56 were offered again in the fall of 1944 and the spring of 1945.[6]

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[1] Modesto Junior College Catalog, 1936-1937. (Modesto: Modesto Junior College, 1936.)

[2] Modesto Junior College Catalog, 1940-1941. (Modesto: Modesto Junior College, 1940.)

[3] Modesto Junior College Catalog, 1941-1942. (Modesto: Modesto Junior College, 1941.)

[4] Modesto Junior College Catalog, 1942-1943. (Modesto: Modesto Junior College, 1942.)

[5] Modesto Junior College Catalog, 1943-1944. (Modesto: Modesto Junior College, 1943.)

[6] Modesto Junior College Catalog, 1944-1945. (Modesto: Modesto Junior College, 1944.)

These courses were given yearly until the fall of 1950.[7]

Speech 54, Radio Speech Techniques, was added to the radio curriculum in 1948-1949. The course granted three semester units and was designed to give basic training in the principles and techniques of effective radio speech.[8]

Speech 54, 55, and 56 were given again in 1949-1950, and Speech 52, Radio Drama, was added. This course was a study of the techniques of radio drama. Members of the class participated in dramatic productions. Two units were granted upon successful completion of the course.[9]

The operation and management of KRJC as a class project of Speech 56 started late in the fall semester of 1949.

The radio courses for 1950-1951 are listed as Radio 41, Introduction to Broadcasting; Radio 42, Fundamentals of Production; Radio 47 and 48, Radio Workshop. Students enrolled in Radio 47 and 48 manage and operate KRJC.[10]

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[7] Modesto Junior College Catalogs, 1945-1946, 1946-1947, 1947-1948, 1948-1949, 1949-1950. (Modesto: Modesto Junior College, 1945, 1946, 1947, 1948, 1949.)

[8] Modesto Junior College Schedule of Classes, Spring, 1949. (Modesto: Modesto Junior College, 1949.)

[9] Modesto Junior College Schedule of Classes, Fall, 1949. (Modesto: Modesto Junior College, 1949.)

[10] Modesto Junior College Catalog, 1950-1951. (Modesto: Modesto Junior College, 1950.)

Since the official introduction of radio courses in 1936, there has been a rather slow growth in the development of the Modesto Junior College radio curriculum. A chronological study of the catalog numbers assigned to radio courses indicates that these courses were first considered to be terminal in nature: courses numbered above 49 are terminal and generally non-transferable to four-year institutions. Because of the desirability for radio students to continue their college work for the A. B. degree, in 1950-1951, radio courses were renamed and renumbered to encourage the continuation of academic work in senior college.[11]

A study of the yearly college inventories shows little radio equipment of broadcast quality before 1948. As late as the fall of 1948, radio courses had use of only the following equipment:*

(1) One sound truck with two turntables. This equipment was in very poor condition.

(2) Two channel audio mixer designed for crystal microphone inputs and six hundred ohm telephone line output. This equipment was of poor quality and was in very poor condition.

(3) One microphone floor stand.

(4) One "home-made" boom stand for crystal microphones. The stand was made in the machine shop at the college.

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[11] Modesto Junior College Catalog, 1950-1951, op. cit.

*Modesto Junior College Inventory, 1948.

(5) One table stand for crystal microphones.

(6) Four crystal microphones.

(7) One stop watch.

(8) One Soundmirror Brush Tape Recorder.

(9) One paper recording tape.

(10) Forty-five assorted sound effects records.

The 1948 list of radio equipment did not include an electric clock; it did not include a radio. By March, 1949, certain essential equipment and material had been added:*

(1) A two-way communication system between the control room and the studio was functioning.

(2) One high fidelity master mixer was under construction.

(3) One typewriter.

(4) One RCA 74B microphone.

(5) Two Western Electric 633A microphones.

(6) One Scott AM and SW radio receiver.

(7) One electric clock.

(8) Two professional quality RecOout turntables.

(9) Two professional quality pickup arms.

(10) One dozen additional paper recording tapes.

(11) One excellent quality AM-FM radio receiver, "The Educator."

Additions found on the college inventory of April, 1950, were of major value to KRJC:**

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* Modesto Junior College Inventory, 1949.

** Modesto Junior College Inventory, 1950.

(1) One additional stop watch.

(2) One complete portable Magnecorder tape recorder.

(3) Three dozen plastic recording tapes.

(4) Two additional electric clocks.

(5) Three microphone "goosenecks."

(6) One good quality sound truck and speaker

Between April, 1950, and February, 1951, KRJC received important equipment and supplies:

(1) Complete sound effects library consisting of ninety-one records.

(2) Two fifty-record carrying cases for sound effects library.

(3) One small Setchell Carlson portable radio.

(4) Two excellent microphone floor stands.

(5) One RCA 77D Pollydirectional microphone.

(6) Six dozen additional plastic recording tapes.

(7) One Zenith FM radio.

(8) One kit of basic radio repair tools.

(9) Replacement radio tubes for all station equipment.

(10) Langworth transcription library of 6700 selections.

(11) Three metal cabinets needed for the storage of the transcription library.

An interview with the Modesto Junior College registrar established the fact that there was activity in radio broadcasting at the college before the introduction of radio courses to the curriculum. In speech courses certain

basic radio principles were practiced. The cooperation and interest of KTRB, the only local radio station, encouraged student radio programs, and rather frequently the station sent an engineer and equipment to the college for student broadcasts.

Starting in 1938, college programs were engineered on limited college equipment and sent by telephone line to KTRB where the programs were recorded. Often the recordings were broadcast. The telephone line to KTRB is still in use.

Occasionally student programs were produced in the studios of KTRB. When KBEE started operations in 1947 student shows were frequently presented from its studios. The purchase of the Magnecorder Tape Recorder by the college eliminated the production of college programs at the commercial stations. In 1950 the four commercial radio stations of Stanislaus County--KTRB, KBEE, KTUR, and KMOD--broadcast, by tape recording, programs which were produced and recorded at Modesto Junior College.

CHAPTER IV

THE ORGANIZATION OF KRJC

In the development of the complete organization of KRJC, the following topics will be explained: (1) the physical plant, (2) station purposes, procedures and organization of staff members, (3) publicity, (4) programming, (5) audience study, and (6) in-class listening.

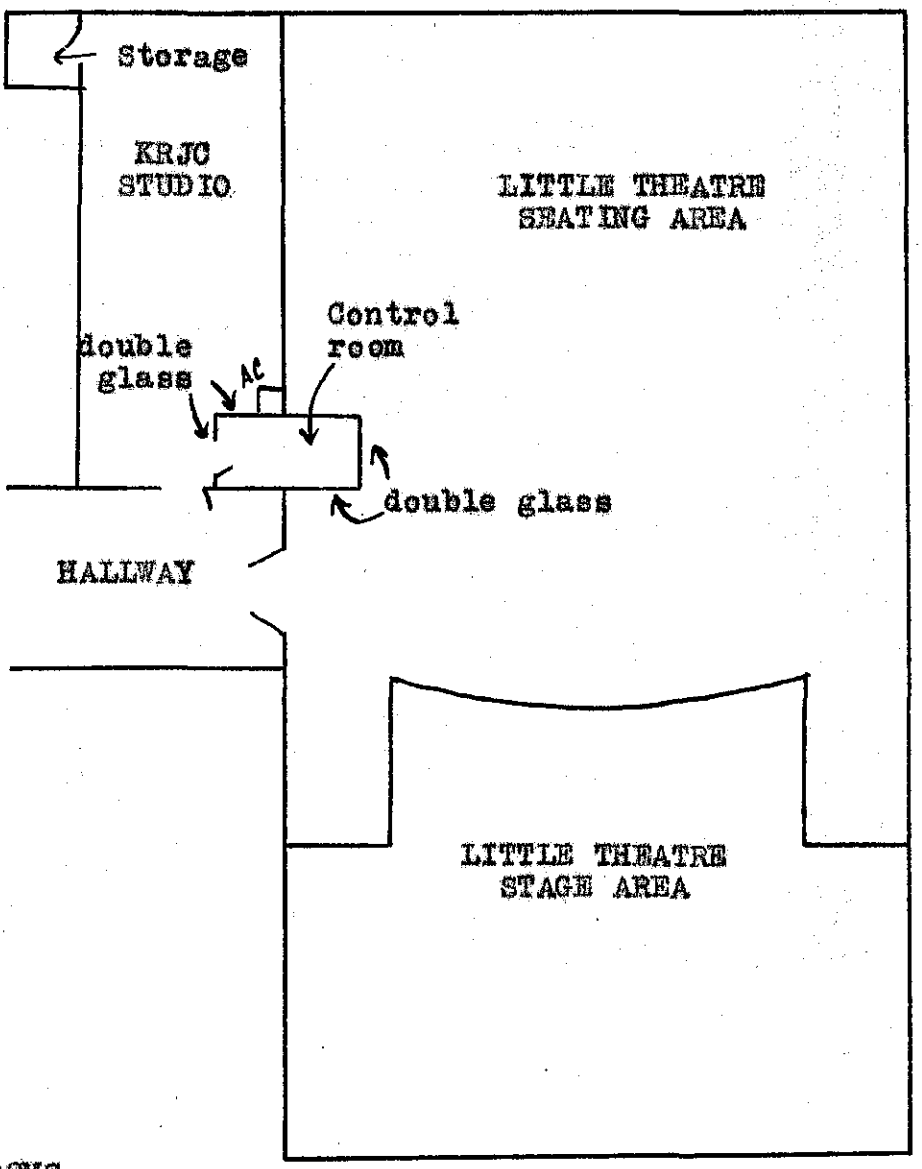
THE PHYSICAL PLANT

The physical plant is considered to be the layout of the studio, control room, workroom, and Little Theater.

KRJC has one radio studio. The studio is 30 feet long and 13 feet wide. The floor is concrete covered with an old carpet. The ceiling is 10 feet above the floor, and the walls and ceiling are covered with wall board. The electrical wall outlet of the studio is indicated in Figure III, page 24.

The control room is 5 feet by 8½ feet. The walls are irregular in shape and covered with wall board. The room has a 12-foot ceiling. The floor is uncovered concrete. As indicated in the drawing, Figure III, parallel class panels afford observation into the studio and Little Theater. Electrical outlets are indicated in Figure III.

The workroom is 6 feet by 5½ feet. The floor is uncovered concrete; walls are unpainted wood. The room



SIZE OF ROOMS

KRJC Studio: 13'6" x 31'

Storage room: 5' x 5'

Control room: 4'6" x 10'

Little Theatre: 42' x 76'

FIGURE III

does not have an electrical outlet.

The Little Theater is the college theater for student play productions. For special programs the theater may be used by KRJC. The theater measures 40' x 76'. The stage area is about 1585 square feet. The theater normally seats 169 people, and the seating area covers 630 square feet.

PURPOSES, PROCEDURES AND ORGANIZATION OF STAFF MEMBERS

As a junior college carrier-current station, KRJC has eight fundamental purposes:

1. To render a vital public service to the student body of Modesto Junior College through programming in the interests of Modesto Junior College students.

2. To serve as an integral part of the educational curriculum of the college by providing valuable radio programs for in-class listening.

3. To provide an honest picture, through actual experience, of the problems of commercial broadcasting to those students who desire to follow broadcasting as a profession.

4. To give students supervised responsibility in the creation and execution of KRJC broadcasts.

5. To encourage the widest experimentation in new types of programs and production techniques.

6. To provide a realistic broadcasting laboratory which will enhance the growth of student skills, thought, cooperation, and leadership.

7. To strive for high broadcasting standards, even at the expense of limiting the number of productions in order to insure quality.

8. To provide a vital service to democratic school government.

A major problem in the initial organization of the station was the formulation of a clearly worded and workable list of station policies, procedures and staff responsibilities. After study and discussion the following plan of organization was developed by the staff and the writer:

KRJC STATION PROCEDURE

1. The entire operation, policies, and programming of station KRJC shall at all times be in accordance with the policies of the administration of Modesto Junior College, the Board of Education, Modesto City Schools, and the established station policy listed below. The station will adhere to the rules and regulations of the Federal Communications Commission and to the general code of broadcasting established by the National Association of Broadcasters.

2. Every program shall begin at the time shown on the program log.

3. A station identification shall be given.

   a. Each time the station comes on or leaves the air.

   b. At the conclusion of each program.

   c. On the hour and on the half hour.

   d. In the case of a program lasting an hour or longer, in as close compliance with c (above) as not to interfere with the continuity of the program.

4. The underlined sentence which follows shall be considered the standard program cue for all live broadcasts

on this station:

This is the Radio Workshop, Modesto Junior College.

5. When KRJC is also operating KTRB-FM, the following underlined sentence shall be the standard station identification:

From the campus of Modesto Junior College, this is KRJC and KTRB-FM, Modesto.

6. When KRJC is operating only its own facilities, the following underlined sentence shall be considered the standard station identification:

This is your campus station, KRJC, Modesto Junior College.

7. All programs shall begin when the second hand of the clock is "straight up" at 12.

8. There shall be a thirty second period between programs. This time period shall be used for station identification, announcements of various types, and when possible, an announcement of the correct time.

9. The correct time shall be given at least once an hour on the hour. It is desirable, when possible, to give the correct time sometime during the thirty second period between programs.

10. Whenever any type of recorded program, lasting over one minute and continuing not longer than five minutes, is played on KRJC, it shall be identified at the beginning of the program with the word

Transcribed.

11. Whenever any type of recorded program lasting over five minutes is played on KRJC, it shall be identified at the end of the program with the sentence

The preceding program was transcribed.

12. When a program contains recorded sections of talk or music, other than themes, sound effects, mood music, or musical bridges, it shall be identified at the beginning of the program with the sentence

Portions of the following program are recorded or transcribed.

13. When a program contains recorded sections of talk or music, other than themes, sound effects, mood music, or musical bridges, it shall be identified at the end of the program with the sentence

Portions of the preceding program were recorded or transcribed.

14. In the event of momentous news, by the decision of the Production Manager, any program may be interrupted to place this news on the air.

15. In the event of electrical power failure, the following announcement (underlined) shall be made at the resumption of broadcasting:

This is KRJC, Modesto Junior College. Due to a power failure, KRJC has been off the air. KRJC went off the air at (time) and returned to the air at (time). KRJC is

owned and operated by Modesto Junior College and broadcasts on a carrier frequency of 660 Kilocycles. Studios are located in the college library building. (We now present the program scheduled for this time.)

16. In the event KRJC has been off the air for any reason other than power failure, the following announcement shall be made at the resumption of broadcasting:

This is KRJC, Modesto Junior College. Due to conditions beyond our control, KRJC has been off the air. KRJC went off the air at (time) and returned to the air at (time). KRJC is owned and operated by Modesto Junior College and operates on a carrier frequency of 660 (six hundred and sixty) kilocycles. Studios are located in the college library building. (We now present the program scheduled for this time.)

17. In the event KRJC is unable to present a scheduled program, the following underlined announcement shall be made at the time the program was scheduled to begin:

Due to conditions beyond our control, KRJC is unable to present the program originally scheduled for this time.

18. In the event of any condition which makes the continuation of any program impossible or undesirable, the following underlined announcement shall be made:

Due to conditions beyond our control, KRJC is unable to continue the program (name of program).

Responsibilities of the KRJC staff.

Introduction. The staff members of KRJC will be considered to be those students of executive responsibility. Staff members are selected by the radio director. Selection is based on student ability, attitudes, demonstrated interest in radio and the progress of the campus station, and the ability to work in cooperation with other students. The writer has found that staff assignments many times contribute to tremendous growth of the individual. Increased responsibility seems to motivate not only more student activity in radio; many times it tends to improve all academic work.

1. The staff of KRJC shall meet in whole at least once a week.

2. Duties and responsibilities of the station manager:

   a. He shall be responsible for conformity to established station policy.

   b. He shall be responsible for maintenance of good production standards.

   c. He shall be responsible for the execution of all staff assignments.

   d. He shall be responsible for the carrying out of all policies and principles of Modesto Junior College through direct contact with the faculty adviser.

   e. He shall keep the station books and make monthly financial reports to the staff and faculty adviser. (To apply at such time KRJC becomes a commercial station.)

   f. He shall be responsible for the station log.

   g. He shall exchange ideas and suggestions with

other college stations in a constant effort to advance KRJC's plans, policies, and overall operation.

h. He shall preside at staff meetings of the station.

3. Duties and responsibilities of the program directors (2):

a. They shall be responsible for the preparation of the daily program schedule and log.

b. They shall be responsible for the copy book.

c. They shall see that all programs have formats and prepared scripts.

d. They shall carefully supervise all scripts to see that the material is well written and in good taste.

e. They shall see that all programs adhere to the station policy.

f. They shall be aware of the types of programs not included in the schedule as it stands, and, if desirable, plan to include such programs.

g. They shall give due consideration to the suggestions received from the audience, to obvious changes of interest on the part of the student body, and to comments and program preferences indicated on surveys taken by or for the station.

h. They shall supervise the filing of scripts, program logs, program schedules, and all other material considered of lasting value to the programming department of the station.

i. They shall submit a weekly report to the manager.

4. Duties and responsibilities of the chief engineer:

a. He shall supervise the maintenance and building of station equipment.

b. At regular intervals, he shall conduct routine inspections of all technical equipment.

c. He shall strive constantly to improve the signal of the station.

d. He shall strive constantly to improve the quality of the equipment and overall transmission.

e. He shall be responsible for assigning a qualified engineer to all remote broadcasts.

f. He shall be responsible for the issuing of technical equipment which is to leave the studio, and he shall check completely the equipment when it is returned.

5. Duties and responsibilities of the director of special events:

a. He shall be aware of the college calendar, and shall keep weekly contact with the person in charge of the college calendar.

b. He shall assign producers for all special events broadcasts.

c. He shall keep an accurate record of all special events broadcasts, and this record shall include a listing of student participation with jobs performed.

d. He shall assist in an evaluation of all special events broadcasts and individual performances during the broadcasts.

e. He shall personally see that all proper arrangements have been made for all special events broadcasts.

f. He shall lend his advice and assistance to the producer and crew of all special events broadcasts.

g. He shall keep close contact and maintain good public relations with those departments of the college which usually provide most of the activities for special events programs.

h. He shall submit a weekly report to the manager.

6. Duties and responsibilities of the director of sports:

   a. He shall have an active interest in sports.

   b. He shall promote the upmost coverage of the sports program of the college.

   c. He shall keep contact with the Director of Athletics.

   d. He shall emphasize collegiate rather than professional sports on all broadcasts.

   e. He shall encourage accurate play-by-play descriptions.

   f. He shall submit a weekly report to the manager.

7. Duties and responsibilities of the director of publicity.

   a. He shall publicize the activities, programming, and personnel of the station.

   b. He shall attempt to reach KRJC's audience by the use of all types of appropriate promotional devices.

   c. He shall maintain a complete scrapbook containing all station publicity.

   d. He shall submit a weekly report to the manager.

8. Duties and responsibilities of the music director:

   a. He shall be responsible for keeping all recorded music correctly filed.

   b. He shall encourage the proper handling of records and transcriptions.

   c. Periodically, he shall see that all recorded and transcribed music is checked for quality and amount of surface noise. Suitable notations should be made in the file, on the record itself, and a list of all unusable selections shall be sent to the programming department.

   d. He shall see that all recorded and transcribed selections are marked with an arrow and number

indicating the number of turns for cueing purposes.

e. He shall be cognizant of the musical preferences of the audience.

f. He shall work with the program department by constantly striving to promote a variety of musical programs of the highest quality.

g. He shall submit a weekly report to the manager.

9. Duties and responsibilities of the recording engineer:

a. At regular intervals he shall check all recording equipment.

b. He shall supervise the filing of all tapes, either for broadcast or future reference.

c. He shall maintain the good condition of all tapes.

d. He shall clear time, sign up for time, and assign a qualified recording engineer for each recording appointment as requested on a recording assignment form.

e. He shall keep an accurate record of recordings made by the station.

f. He shall submit a weekly report to the manager.

10. Duties and responsibilities of the director of education:

a. He shall study and read professional literature describing the many uses of radio and television as aids to learning.

b. He shall maintain a scrapbook and notebook containing material which describes methods of using radio in the classroom.

c. He shall keep constant contact with the college administration and instructional staff, and he shall offer the facilities of the station to the college for in-class listening. He shall be receptive to ideas from the college staff and shall encourage experimentation.

d. He shall keep an accurate, up-to-date record of all programs broadcast for in-class purposes. This record shall include: name of the program, description of the program, the number of people in the listening class, and, whenever possible, an objective evaluation of the program by the members of the class and the instructor.

e. He shall present a weekly report to the manager.

11. Duties and responsibilities of the director of sound effects.

a. He shall be responsible for keeping all sound effects material, including recordings, properly stored and correctly filed.

b. He shall encourage the proper handling of all records and materials used for sound purposes.

c. He shall supervise the use and distribution of sound effects, and he shall lend assistance to all producers and sound personnel as assigned by producers.

d. He shall supervise the design and building of new sound effects.

e. Periodically, he shall check all recorded sound effects for quality and surface noise. Suitable notation should be made in the file and on the record itself. A list of all unusable records should be sent to the programming department.

f. He shall have an active understanding of the contents of the sound library, recorded and mechanical, and he shall understand the operation of all effects.

g. He shall submit a weekly report to the manager.

In addition to the staff of the station, KRJC uses a production manager to supervise the nighttime operations of the station. The idea for this manager came to KRJC from KBYU at Brigham Young University, Provo, Utah. The

basic plan used at KBYU was modified to make it workable at KRJC.

The board shifts at KRJC are 6 P.M. to 8:30 P.M., and at least two people are on duty during those hours. The board operator and the production manager arrive well before the sign on time of 6 P.M. The board operator and the production manager alternate jobs from week to week. In this way a student is a board operator every other week, and he is a production manager on the intervening weeks. Of course, each pair works only one night a week.

The production manager fills out a check list which is placed on the manager's hook after the station signs off at 8:30 P.M. In order to clarify the production manager's report sheet, the writer should point out that during the first two hours of KRJC's nightly schedule, the campus station is also operating KTRB-FM. This is accomplished by direct telephone line from the KRJC studio to the master control and FM transmitter of KTRB-FM. The junior college programming of KTRB-FM ends at 7:59:30 P.M. on Monday, Tuesday, Wednesday, and Thursday nights. For important broadcasts, KRJC also operates KTRB-FM at other times in addition to the regular broadcast schedule. A sample of the production manager's report to the station manager is found in the Appendix. The report is designed to be concise and very specific.

Due to physical limitations, it has been impossible

to give each staff member of the station a mail box. Some method of easily and rapidly reaching staff members proved to be necessary, and a very simple hookboard was placed on the south wall of the studio. The base of the hookboard was made of a strip of wood, 64 inches long, 1½ inches wide, and 1 inch thick. Eight finishing nails, about two inches long, were driven about three-quarters of an inch into the strip at intervals of about ten inches. Then the strip of wood was nailed to the wall of the studio. The nails on the hookboard tilt slightly upward, and therefore, papers, notes, letters, etc., will not fall of the hooks. All organizational forms used by the station, such as memorandum sheets, recording requests, and requests for special events broadcasts, are center-punched at the top of the page, and all full-size (8½" x 11") sheets are punched with the standard three holes at the left side. This allows all official forms and messages to be placed easily on the hookboard, and it expedites the efficient filing, in three-ring binders, of all items considered of lasting value. A photograph of the hookboard is found in Figure IV, page 38.

Copies of organizational forms used by the station are found in the Appendix.

PUBLICITY

A college carrier-current station must use its own

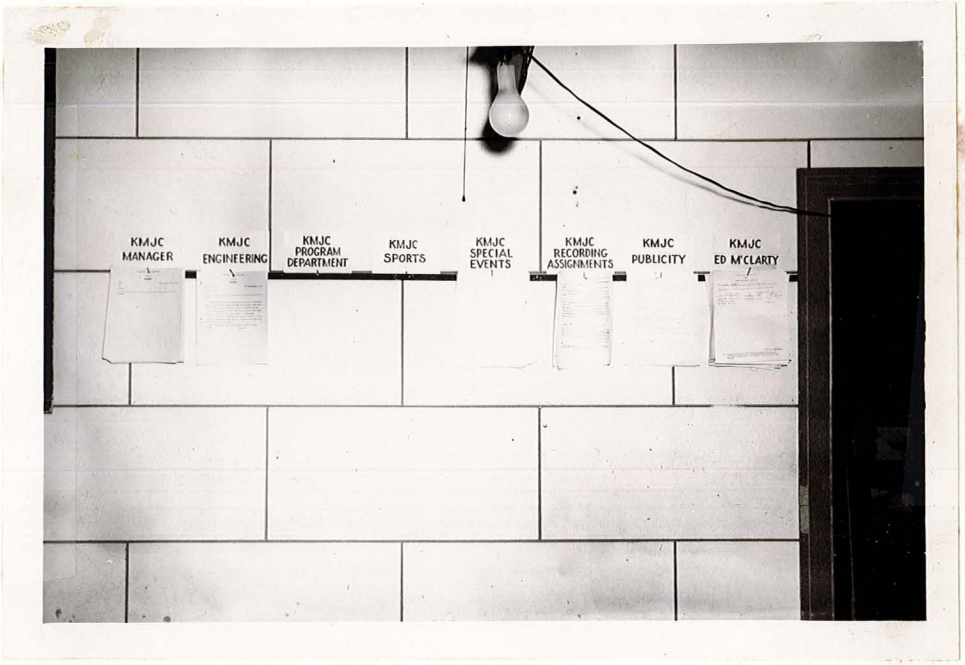


FIGURE IV

THE KRJC HOOKBOARD

facilities and all possible means to explain its activities, functions and contributions to the student body and to the college. The campus station needs a continuous, vital and honest program of publicity.

Waller makes an excellent discussion of radio station publicity:

> From the standpoint of a radio station, publicity has the primary purpose of helping to build and keep the station's audience. As between two stations of equivalent coverage and programs, publicity can be the margin that gives one station a better and more consistent audience than the other.
>
> The second purpose of station publicity is to keep the station, its people, and its service on a respectable footing with the public.
>
> A third purpose is to help to build and maintain a commercial advertiser's good opinion of the station . . .[1]

The first two purposes outlined by Miss Waller are of vital concern to KRJC, and the third purpose will assume major importance if and when KRJC begins operations as a commercial station.

Since the time KRJC first started regular broadcasting, it has had use of several publicity outlets.

The station itself has been used for station publicity; spot announcements and planned program summaries have been used frequently.

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[1] Judith C. Waller, Radio The Fifth Estate (San Francisco: Haughton Mifflin Company, 1946), pp. 349-350.

The Modesto Junior College weekly newspaper, The Collegian, has served as an excellent outlet for station publicity. A special reporter has been assigned to radio activities, and the coverage of station plans and accomplishments are well described. From time to time, the Collegian prints a complete program schedule with brief descriptions of student productions. Much of the publicity in the Collegian has been coverage of completed radio station projects rather than advance releases of station plans. This condition was due to many last minute decisions made by the station. On Friday morning, perhaps, it was decided to broadcast a baseball game later that afternoon. Such last minute plans allow for little advance publicity by a weekly paper.

Last minute plans for a special broadcast, when spurred by student enthusiasm, to serve the student body or the college curriculum have not been discouraged, provided these plans are justified, workable and complete. To cite an example of a highly motivated program, the writer will describe the factors which led to last minute plans to broadcast a baseball double-header between San Francisco City College and Modesto Junior College:

During the Spring baseball season of 1950, San Francisco City College and Modesto Junior College were the leading contenders for the Northern California Junior College Conference championship. Late in the season, a base-

ball double-header between these teams was scheduled to be played at Modesto Junior College. The outcome of these games was to determine the conference champion. San Francisco needed one victory to take the crown; Modesto needed a double victory. On the night before the game, a Modesto pitcher became ill with the mumps. The ill player lived in one of the trailers on campus, and he wanted to follow the fortunes of his teammates. Last minute preparations were made to broadcast the games. Student response indicated that the station had a very favorable audience for the broadcast.

The baseball broadcast cited did not in any way allow for advance publicity by the station or the college newspaper. The next issue of the Collegian described KRJC's coverage of the game.

From time to time, KRJC has received publicity in the form of stories in the Modesto Bee and various weekly papers of the county. Almost always, these stories were written and distributed by the Modesto Junior College Director of Publications.

As another means of publicity, several times during the spring semester, the KRJC publicity director distributed program notes to the apartments and trailers on the campus.

To keep KRJC "in the eyes of the public", the station prepared a radio float for the annual noise parade

through downtown Modesto.

Added publicity was given to the station when it provided background music before the start of dramatic presentations in the college little theater. When a KRJC sound engineer played sound effects for a dramatic production, mention of KRJC was made in the official program of the play.

Many students working on KRJC have placed black and gold decals--KRJC--on the windshields and back windows of their cars.

KRJC decals have been placed at appropriate places along the entrance to the studios and on certain radio equipment.

The Modesto Junior College daily bulletin carries frequent notices of important KRJC broadcasts.

PROGRAMMING

Authorities agree on the importance of a radio station's program structure. Reinsch places considerable emphasis on the importance of the program department:

> The cornerstone of your organization should be the program department. People listen to programs. Programs build circulation, and circulation is what you sell. The program department, therefore, should extend to all programs--both commercial and sustaining. A good program director will know the interests of his listeners and will provide a well-balanced schedule.[2]

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[2] J. L. Reinsch, Radio Station Management (New York: Harper and Brothers, 1948), p. 7.

Reinsch's discussion, with the exception of his commercial references, is entirely applicable to KRJC. If and when KRJC becomes commercial, all of Reinsch's comments will become applicable.

Waller states:

> Basic to the understanding of how to plan a program schedule is an understanding of the station's audience every hour of the broadcasting day. This involves not only numerical considerations, which are reasonably easy to check, but much more complex factors, such as sex and age of the listener mass, the time of day, the season of the year, national or international events which may have a bearing on listener habits, the intelligence norm of the group, and listener likes and dislikes in the way of program material.[3]

The criteria for audience study suggested by Miss Waller are reasonably easy to apply at Modesto Junior College. The station's campus audience, at night, has been comprised of junior college students, their wives (sometimes students), their children, and a faculty member with his family. Most daytime broadcasting has been for in-class purposes. Later this paper will describe an audience survey conducted by KRJC in order to determine listening hours of the potential audience and the comparative program likes of the audience.

KRJC started programming to the campus audience on Monday, January 23, 1950. At that time its program struc-

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[3] Waller, op. cit., p. 71.

ture was very limited. A serious lack of program materials, especially music, presented a major problem. KRJC possessed a very limited musical library composed of about fifty old transcriptions which were given to the station by KTRB, Modesto. The station did not have a news service. KRJC did have, however, permission to rebroadcast any program, with the exception of College of the Pacific football broadcasts, released by KCVN, the FM station of the College of the Pacific, Stockton, California.

An investigation of KRJC's program schedule of the evening of January 23, 1950, reflects the station's lack of programs and entirely too much dependence on KCVN.

KRJC program schedule of January 23, 1950:

Time	Program	Origin of Program
5:59	Sign On	Control room
6:00	Dinner Concert	KCVN
7:00	News	KCVN
7:15	Pan American Rhythm	Control room
7:30	Five Centuries of French Music	KCVN
8:00	Campus News	Studio
8:15	Here's to Vets	KCVN
8:30	Platters with Parkhurst	Control room
9:00	Sign Off	Control room

The three hours of programming indicated in the above schedule are weak from the standpoint of collegiate

listening habits, and the three hours provided limited learning experiences for the student at the control board because of excessive rebroadcasting of KCVN. During the seventy-six minute period, 5:59 - 7:15, the board operator made the sign on, a station identification at 6:30, a station identification and short announcement at 6:59:30, and a station identification and short announcement at 7:14:30. The performance of these duties, plus monitoring and "riding levels" from KCVN, comprised the learning experience of the student for the first seventy-six minutes of a board shift which lasted ninty-one minutes. This board shift tended to become routine and monotonous.

The three-hour period devoted twenty-nine minutes and thirty seconds to popular music. This was a basic weakness in the program schedule, because we were to learn later by survey, that popular music was the favorite type of radio program with the students living on the campus of Modesto Junior College. KRJC surmised the appeal of popular music before the survey, but the limitations in the station's musical library hampered a more collegiate program schedule.

KRJC's dependence on KCVN grew less as the Spring Semester, 1950 progressed. Three factors led to more local and independent programming: (1) increased program production by students of the radio workshop, Modesto Junior College; (2) a continually increasing number of programs made

available to KRJC on transcriptions or tape recording; and (3) an agreement with KTRB whereby KRJC was to operate KTRB-FM, with the transcription libraries and news services of KTRB available for use by KRJC.

KRJC has the following sources of programs:

(1) Student production of the radio workshop, Modesto Junior College.

(2) Transcribed music from KRJC's musical library.

(3) Transcribed music from the Lang-Worth and Standard transcription libraries made available by KTRB.

(4) Rebroadcast of KCVN, College of the Pacific, Stockton

(5) Collegiate programs on tape from the Western Collegiate Radio Exchange.

(6) Transcribed programs from the United States Army.

(7) Transcribed programs from the United States Navy.

(8) Transcribed programs from the Treasury Department of the United States.

(9) Transcribed programs from the American Red Cross.

(10) Transcribed programs from the French Broadcasting System.

(11) Transcribed programs from the British Broadcasting Corporation.

(12) Transcribed programs from the American Cancer Society.

(13) Transcribed programs from the United States National Guard.

(14) Transcribed programs from the United Nations.

(15) Live and transcribed productions of high schools of Stanislaus County.

During the week of March 6, 1950, a meeting was held in the office of the city superintendent of schools. Attending the meeting were Mr. William Bates, General Manager of the KTRB Broadcasting Company; Mr. Milton Hibdon, Program Director of KTRB and KTRB-FM; Dr. James Corson, Superintendent, Modesto City Schools; Dr. Henry T. Tyler, President, Modesto Junior College; Mr. Thomas Chapman, Coordinator of Educational Services, Modesto City Schools; and the writer of this paper, the director of KRJC.

At this meeting, Mr. Bates offered KRJC, under the supervision of its radio director, the opportunity to use KTRB-FM as an outlet for its programs. The entire operation of the FM station was to be carried out by KRJC by means of the telephone line already existing between KRJC and KTRB. Complete details for operational procedures were to be accomplished by Mr. Hibdon and the KRJC director. Mr. Bates offered KRJC the use of the KTRB's transcription libraries.

KRJC started its programming of KTRB-FM on Monday, March 13, 1950. By this date KRJC had reduced its program schedule to two hours nightly. The two-hour period was also carried by KTRB-FM. The program schedule of March 13, 1950, clearly reveals less dependence on KCVN, and therefore considerably more practical experience for the board

operator.

KRJC and KTRB-FM program schedule of March 13, 1950 (KTRB-FM was on the air for a nineteen-hour schedule)

Time	Program	Origin of Program
5:59	Sign on	Control room
6:00	Twilight Serenade	Control room
7:00	News	KCVN
7:15	Man About Campus	Control room
7:30	Everlasting Symphones	Control room
8:00	Sign off	Control room

A comparison of KRJC's program schedules of January 23, 1950, and March 13, 1950, shows a graphic change in the percentage of air time produced at KRJC. On January 23, 34.8 per cent of the air time was produced at KRJC; 65.2 per cent of the schedule came from KCVN. On March 13, 89.1 per cent of the air time was produced at KRJC; 11.9 per cent came from KCVN. Increased student interest resulted from this change in the source of programs.

The lack of popular music is strikingly apparent in the March 13 schedule.

An investigation of KRJC's program schedule of April 25, 1950, indicates another change in the programming of the station. The broadcasting period was increased to two and one-half hours, with the sign off at 8:30 P.M. KRJC programmed KTRB-FM until 7:59:30 P.M.

KRJC program schedule of April 25, 1950:

Time	Program	Origin of Program
5:59	Sign on	Control room
6:00	Twilight Serenade	Control room
7:00	News	KCVN
7:15	Drama from Collegiate Exchange--Chico State	Control room
7:45	Hawaiian Melody	Control room
8:00	Strictly for the Record	Studio and Control room
8:30	Sign off	Control room

The schedule of April 25 shows 90.4 per cent of the air time handled in the studio or control room with only 9.6 per cent coming from KCVN. Forty-four minutes of the schedule were popular or semi-popular music. To be noted in the schedule is a dramatic program, on tape, from Chico State College.

A major weakness of the KRJC program structure was a lack of localized news broadcasts. Since its first day of broadcasting, KRJC took its world news broadcasts from KCVN. KCVN's coverage of the news was based on the world wide facilities of the United Press, plus local College of the Pacific news and news of the Stockton community. The KCVN news presentations were largely designed for listening by a Stockton audience, and in this sense they were foreign to the Modesto campus and community audience. Due to the nature of KCVN's news broadcasts and the desirability

to give radio students of Modesto Junior College experience in news broadcasting, steps were taken to provide local and world news presentations from the studios of KRJC.

On May 7, 1950, arrangements were made for KRJC to have use of the radio and press wire services of KTRB. The radio wire of the United Press and the news wire of the International News Service were made available for news presentations by KRJC students. Most of KRJC's news broadcasts from May 15 to the end of the spring semester were edited and voiced by Junior college students. The new arrangement with KTRB was not without a problem; transportation was the problem. KTRB is inaccessible by public transportation, other than taxi-cab. No plan or system of transportation was attempted; each newscaster was responsible for his own transportation to and from KTRB.

Table I shows the distribution of quarter-hour program periods according to type of programs from January 23, 1950, to June 7, 1950.

AUDIENCE STUDY

During the last week of May, 1950, KRJC, under the direction of the director of its publicity, undertook a survey of the station's potential audience on campus. The purpose of this survey was three-fold: (1) to determine approximately how many hours per day people in the potential audience listen to the radio, (2) to determine what hours,

TABLE I

QUARTER HOUR PROGRAM PERIODS ON KRJG

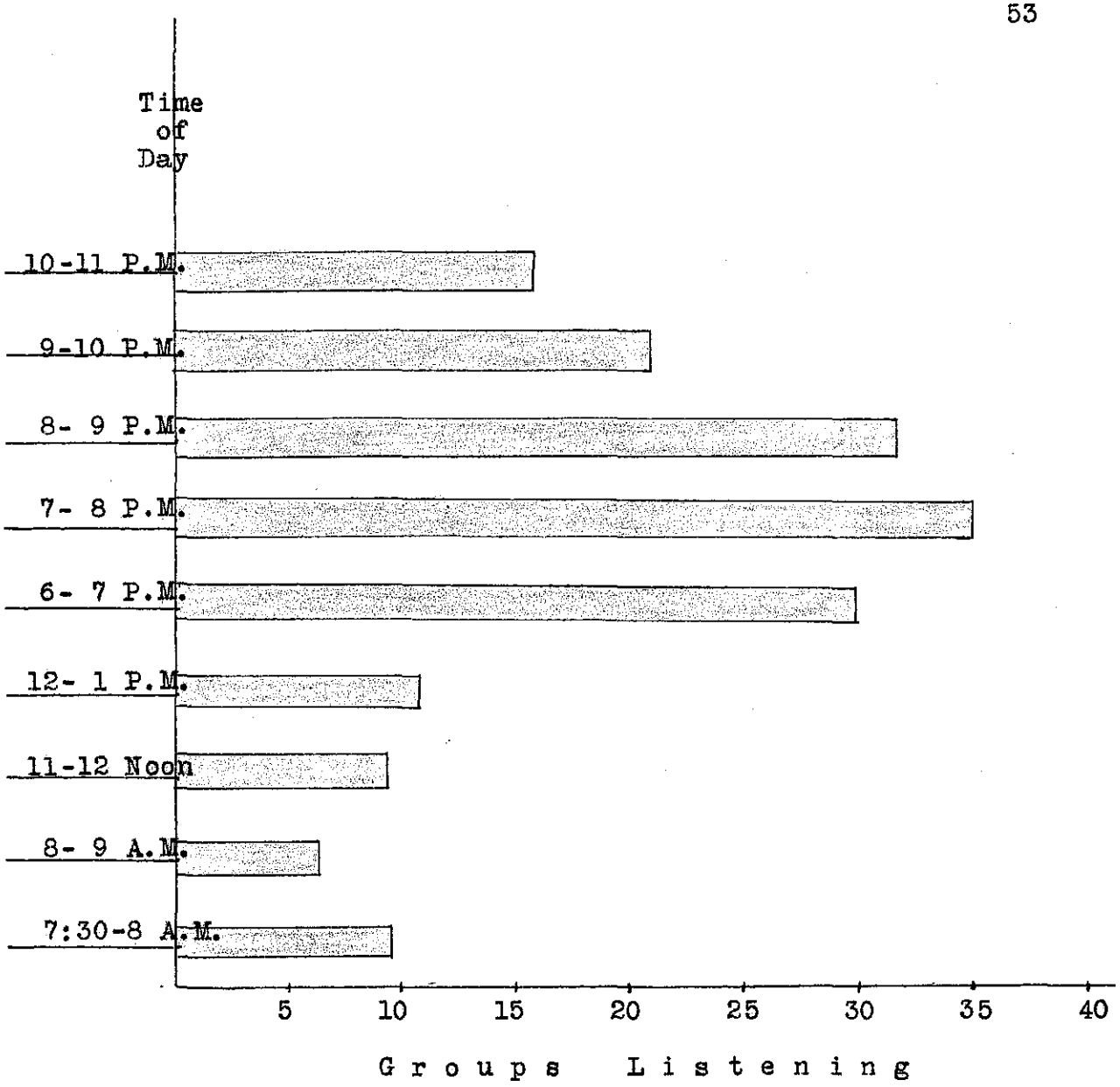
DURING THE PERIOD JANUARY 23, 1950 - JUNE 7, 1950

Type of Program	MONTHS					
	January	February	March	April	May	June
MUSIC:						
Classical	5	8	19	7	8	2
French	5	4	0	0	2	0
Latin American	5	2	2	0	0	0
Popular	27	20	37	22	32	12
Progressive	6	10	6	2	8	2
Semi-classical	59	32	74	66	70	25
DRAMA:						
Mystery, Comedy	4	2	15	16	22	8
Documentary	1	3	2	2	5	1
TALK:						
News	5	11	19	13	18	4
Round table	0	0	0	0	1	1
Campus opinion	0	1	3	3	5	2
Interview	1	1	5	2	3	1
Speeches	2	0	0	5	0	0
Sports	0	6	14	11	36	2
Total quarter hour periods	130	100	196	140	212	60

during the time periods when KRJC could or does broadcast, the audience listens to the radio, and (3) to determine the comparative popularity of various types of programs with the campus audience. The survey reflects the habits and likes of family or roommate groups rather than individual preferences. The survey was able to reach fifty-nine of the seventy-six family or roommate groups; the survey reached 77.6 per cent of those living on the campus. Of the fifty-nine groups reached, four were without radios; 94 per cent of the group had radios. The survey shows that the average number of hours spent listening to the radio is 4.2 daily. For those with radios, the time spent listening to the radio varied from fifteen minutes to fifteen hours. The survey indicated that the campus audience likes popular music most and opinion programs least.

Figure V is a bar graph indicating when groups on campus listen to the radio. The times shown are times when KRJC is on the air or could be on the air. The survey shows most groups listen between 7 and 8 P.M; least listen between 8 and 9 A.M.

The bar graph of Figure V indicates that KRJC's nightly program schedule from 6 P.M. to 8:30 P.M. is in keeping with the listening habits of its audience. In addition, the graph shows the advisability of lengthening the program schedule to at least 9 P.M.



BAR GRAPH SHOWING WHEN FAMILY OR ROOMMATE GROUPS LISTEN TO THE RADIO DURING THE TIME KRJC IS BROADCASTING OR COULD BE BROADCASTING

FIGURE V

Figure VI shows the KRJC survey sheet. Survey sheets of this type were taken to living units by KRJC students, and the sheets were filled out in the presence of the survey worker. The results of question number 3 of the survey sheet are weighted numbers. The weighted numbers indicate a very strong popularity of all types of music and sports. The results of question number 2 of the survey sheet are found in the bar graph of Figure V, page 53.

Table II, page 56, shows the weighted score and the average score (weighted score divided by the number of respondents) for types of radio programs in rank order of popularity.

Table III, pages 57, 58 and 59, shows a breakdown of the results of question number three of the survey sheet. It will be noted that the classification, popular music, received by far the largest number of first place selections. The very large second choice selection of sports programs resulted in a high ranking for sports in the weighted scores in Table II, page 56.

The breakdown of the results of the program preference section of the KRJC audience survey shows a tremendous difference in program preferences. These differences must be considered in the formation of the program schedule.

Again, Reinsch offers a discussion applicable to KRJC:

K R J C LISTENERS' SURVEY

Your campus radio station, K R J C, seeks your help on a very important radio survey. Please take a few minutes to answer the questions on this sheet. K R J C's future broadcasting schedule and programming will be based on the results of this survey.

1. Approximately how many hours per day do you listen to the radio?

   Average - 4.2 hours.

2. From the hours listed below, circle the times you listen to the radio.

   7:30 - 8:00 A.M. 8:00 - 9:00 A.M. 11:00 - 12 Noon

   12:00 - 1:00 P.M. 6:00 - 7:00 P.M. 7:00 - 8:00 P.M.

   8:00 - 9:00 P.M. 9:00 -10:00 P.M. 10:00 - 11:00 P.M.

3. Rate the following types of programs on KRJC in order of your preference, using numbers 1 through 7.

   Classical Music_____

   College Opinion_____

   Drama _____

   Interviews and round tables _____

   News _____

   Popular Music _____

   Sports _____

FIGURE VI

TABLE II

THE RATING OF TYPES OF RADIO PROGRAMS LISTED IN QUESTION THREE OF THE KRJC AUDIENCE SURVEY IN RANK ORDER WITH WEIGHTED NUMBERS AS EXPLAINED AND AVERAGE SCORE

Type of Program	Weighted Score	Average Score	Rank
Popular Music	357	6.1	1
Sports	280	4.7	2
Classical Music	260	4.4	3
News	247	4.2	4
Drama	195	3.3	5
Interviews and round tables	168	2.8	6
College Opinion	161	2.7	7

TABLE III

FIRST THROUGH SEVENTH PLACE CHOICES OF PROGRAM POPULARITY

First Place Choices on the KRJC Audience Survey

Classical Music	13
College Opinion	0
Drama	0
Interviews and round tables	2
News	0
Popular Music	37
Sports	7

Second Place Choices on the KRJC Audience Survey

Classical Music	9
College Opinion	1
Drama	6
Interviews and round tables	3
News	8
Popular Music	8
Sports	24

TABLE III (Cont'd)

Third Place Choices on the KRJC Audience Survey

Classical Music	4
College Opinion	4
Drama	12
Interviews and round tables	8
News	19
Popular Music	6
Sports	9

Fourth Place Choices on the KRJC Audience Survey

Classical Music	12
College Opinion	13
Drama	8
Interviews and round tables	4
News	16
Popular Music	2
Sports	3

Fifth Place Choices on the KRJC Audience Survey

Classical Music	6
College Opinion	13
Drama	14
Interviews and round tables	7
News	9
Popular Music	2
Sports	7

TABLE III (Cont'd)

Sixth Place Choices on the KRJC Audience Survey

Classical Music	7
College Opinion	14
Drama	7
Interviews and round tables	21
News	6
Popular Music	2
Sports	2

Seventh Place Choices in the KRJC Audience Survey

Classical Music	8
College Opinion	12
Drama	11
Interviews and round tables	12
News	1
Popular Music	2
Sports	8

> To build a balanced program you must know the preferences of your listeners. In southern Florida, for instance, there is less interest in baseball than in southern Ohio. The hillbilly music preferred in the Dallas area is different from the hillbilly music desired by San Antonio listeners. In some areas good music is arranged on the basis of appealing to a majority of the listeners all the time. Recognize and cater also to the program preferences of minority groups, for you have an obligation as a licensee to provide a well-rounded program schedule for all segments of your potential audience.
>
> Your program schedule should mirror the area which you serve. Only by careful study and hard work will you have a clear reflection of this.[4]

KRJC does not come under the direct or implied obligations of the licensee as elaborated by Reinsch. However, the carrier-current has a definite obligation to the campus audience and to the radio students of Modesto Junior College. KRJC has the obligation of providing a well-rounded program schedule for the potential audience, and it has the obligation of giving its students the opportunity to formulate a well-rounded schedule and to carry out the various functions necessary to produce all types of radio programs.

IN-CLASS LISTENING

The expression "in-class listening" refers to the controlled classroom situation in which the entire class listens to a certain radio program. This section will

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[4] Reinsch, op. cit., p. 25.

point out some of the factors which led to use of KRJC for in-class listening.

The major factor making possible programs for in-class listening was KRJC's possession of an excellent tape recorder--the Magnecorder. In February, 1950, KRJC started a unique project. Junior college students studying Spanish with their instructor, Miss Mary Phillips, came to the KRJC studio to make tape recordings in Spanish. Short Spanish plays were performed by the advance Spanish groups, and later in the semester these plays were broadcast for in-class listening by beginning Spanish students. It should be pointed out that the advance students with their instructor recorded the programs during their normal lunch hour. It seems reasonable to assume that interest in the project was keen. The advanced students always waited to hear their performances after the tape recording was made. From the interest displayed in the beginning classes, the period of in-class listening was a motivating experience. Later in the semester, the language department received its own tape recorder, which has been used often for individual and group recordings.

The journalism department has used KRJC for in-class purposes with success. A brief explanation of one successful journalism program will be given here. A class in news reporting had been studying the various techniques of conducting interviews. After a thorough discussion of news

interviews, one member of the class was chosen to interview a member of the faculty. The faculty member and the student interviewer met in the KRJC studio for the interview. When the interviewer was ready, the interview began, and a KRJC student engineer tape recorded the entire interview. After the interview, the student wrote a news story based on the facts she received during the interview. Later in class this story was read aloud for group evaluation. Following the reading of the story, the entire class listened to KRJC and the original interview. KRJC was on the air to present this special program for in-class listening. This procedure gave the class the opportunity to listen to the story, which was based entirely on the interview, and to the interview as it actually took place. Student interest was high, and this program proved to be an aid to learning.

Campus Mirror, a series of 15-minute programs of student opinion on subjects of national and international importance, was produced by KRJC and was used for in-class listening in speech and social science courses. Under the supervision of the instructor, classes listened and discussed one program, and then members of the class provided the opinions necessary for the next program in the series. Students were given the opportunity to express oral and written opinions on the question.

In order to gain an evaluation of these programs, a

questionnaire sheet was given to each student in class. In some cases the questionnaire sheet was not given to the class until about two weeks after the program was heard in class, and the writer recognizes this as a limitation of the results. The nature of some of the questions on the questionnaire sheet necessitated a period of a few days between the time of listening to the program in class and the completion of the questionnaire by the individual student. The questionnaires were distributed in five different classes which heard three different programs of the Campus Mirror series. The questions of the three programs were: "Is the United Nations Doing the Job It Was Designed To Do?", "Are Loyalty Oaths Valuable?", and "Should the United States Give Aid to Spain?" The programs on Spain and the United Nations were each heard in one class; the loyalty oath question was heard in three different classes. The five classes comprised a total of 87 students. The questionnaire sheet will be found in the Appendix, and Table IV shows the results of the questionnaires.

Since Campus Mirror is a talk program, its showing on the student questionnaire is to be considered very good.

In a very recent collegiate radio text book, Skornia, Lee, and Brewer state:

> American radio in general does not enjoy too good a reputation for its radio talks. Surveys reveal that few listeners will select talks, other than newscasts, for regular listening, if other

TABLE IV

RESULTS OF THE STUDENT QUESTIONNAIRE

FOR THE EVALUATION OF THE PROGRAM CAMPUS MIRROR

Questions	Choice of completions or answers	Students Responding	Per Cent of total
1. Did you find the subject of the program	a. very interesting?	17	19.3
	b. interesting?	49	55.7
	c. slightly interesting?	18	20.4
	d. of no interest?	4	4.5
2. Did you believe the program itself was of	a. great educational value?	14	15.6
	b. educational value?	59	60.5
	c. slight educational value?	17	18.9
	d. no educational value?	0	0
3. From the standpoint of your interest and attention, was the program	a. too long?	6	6.9
	b. about right?	77	88.5
	c. too short?	4	4.6
4. To what extent did the program result in your increased interest in the subject?	a. greatly?	18	21.4
	b. some?	39	46.4
	c. slightly?	16	19.0
	d. none?	11	13.1

TABLE IV (Cont'd)

Questions	Choice of completions or answers	Students Responding	Per cent of total
5. To what extent did the program result in discussion with your classmates about the subject?	a. greatly?	13	14.9
	b. some?	30	34.5
	c. slightly?	23	26.4
	d. none?	21	24.2
6. To what extent did the program result in discussions with your roommate about the subject?	a. greatly?	4	8.7
	b. some?	12	26.0
	c. slightly?	6	13.1
	d. none?	24	52.1
7. To what extent did the program result in discussion with your family about the subject?	a. greatly?	5	6.6
	b. some?	14	18.4
	c. slightly?	12	15.8
	d. none	45	59.2
8. Would you have listened to this program on your own time?	a. yes	22	26.2
	b. perhaps	25	29.8
	c. no	37	44.0
9. Do you believe the method for getting students' opinions for the program Campus Mirror is democratic?	a. yes	86	98.9
	b. no	1	1.1

types of programs are available.[5]

Waller views the same idea in even stronger terms:

> Of all radio program forms, the radio talk is the hardest to write, to give, and to make interesting and acceptable to the listening public. The first inclination of almost everyone, in turning on the radio and finding someone talking, is to switch the dial immediately until a musical program is found. That is done almost as unconsciously as breathing.[6]

An investigation of the questionnaire results shows that of 88 students answering the first question, 84, or 95.5 per cent, indicated some degree of positive interest in the subject of the program. It is reasonable to conclude that the selection of questions for these three programs, at least, was excellent.

It is interesting to note that all of the students answering question number 2 felt that the program had some positive degree of educational value.

Eighty-eight and five tenths per cent of the students thought that the 15-minute period was "about right" for the program. It is impossible to determine to what extent the past conditioning of these people by American radio hindered a thoughtful answer. Most American radio programs last 14 minutes and 30 seconds--"15" minutes.

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[5] H. J. Skornia, Robert H. Lee and Fred A. Brewer, Creative Broadcasting, (New York: Prentice-Hall Inc., 1950), p. 103.

[6] Waller, op. cit., p. 176.

The results of question No. 4 show that 86.9 per cent of the respondents believed that the program increased their interest in the question of the program to some positive extent. This result is probably a reflection of two factors: (1) a good selection and presentation of the questions for the program Campus Mirror, (2) from this sampling at least, a rather broad base of collegiate interest at Modesto Junior College. Comparing questions 1 and 4, we find 95.5 per cent having interest in the subjects and 86.9 per cent having increased interest due to the radio program.

The results of questions 5, 6, and 7 are encouraging. The program resulted in discussion of the subject with classmates by 75.8 per cent of the respondents, with roommates by 47.9 per cent, and with families, 40.8 per cent. It is clear that the program's ability to motivate discussion is most effective in the class itself; however, the rather large percentage of students who brought these questions to their roommates or families is significant. Since free discussion is extremely important in a democratic state, the discussion as a result of the programs indicates that a campus radio station, when used for the purposes of in-class listening, can make considerable contributions to the exchange of ideas and thoughts.

The answers to question 8 show that 44 per cent of the students reached would not listen to the program on

their own time; 26.2 per cent said they would listen; 29.8 per cent fall in the perhaps class. Once again the results are encouraging in light of Waller's discussion about talk programs.

It is astounding to learn that 98.9 per cent of the respondents thought the method of getting students' opinions for the program was democratic. Only one student felt the method was undemocratic, and his questionnaire states, "Not enough variety among students. Only certain groups are chosen from."[7]

The program can easily defend itself on the charge by this one student. In each and every broadcast the type and size of the group providing opinions was carefully stated at the beginning of the program.

KRJC's work for in-class listening is in its infancy. Vigorous attempts to improve and expand this work will continue.

---

[7] Questionnaire Sheet, (Modesto: KRJC, 1950).

CHAPTER V

THE KRJC TRANSMITTER AND OTHER IMPORTANT STATION EQUIPMENT

This chapter is organized under four major headings: (1) the basic transmitter, (2) the system of radio frequency distribution, (3) the monitoring system and (4) production equipment. The discussion of the basic transmitter will include essential information: schematic drawing of the transmitter, modulator and power supply; complete list of parts needed for the construction of the complete transmitter; current wholesale prices of all parts; professional photo of transmitter, modulator and power supply; and audio frequency proof of performance measurements as determined by a professional radio engineer. The section concerned with the system of radio frequency distribution will describe the methods used to send radio frequency energy from the transmitter to many locations on the campus. The section dealing with the monitoring system will describe the audio frequency amplifiers, radios and audio frequency telephone lines used by the station. Equipment used essentially in the production of student radio programs will be briefly described in the section on production equipment.

THE BASIC TRANSMITTER

KRJC uses what is essentially a five watt, 660 K.C.,

crystal controlled AM transmitter. The parts used in the basic transmitter unit--transmitter, modulator, and power supply--are inexpensive and are of the quality generally used by amateur radio operators, but the performance qualities of KRJC are definitely comparable to the finest AM professional transmitters. The excellent quality of the college transmitter is accomplished by the unique system of modulation used. Instead of the common use of high fidelity transformers in conventional plate to grid modulation, KRJC uses the cathode follower method of modulation. In this way the inexpensive components--the interstage and final modulation transformer--do not in any way prevent high fidelity response. For the convenience of those interested in carrier-current installations, a schematic diagram of the present KRJC transmitter is included in this report, and in addition a complete list of model numbers, catalog numbers, weights, and prices is given for each part needed for the construction of the complete broadcasting unit. These parts are not the exact ones used in the KRJC unit which uses many parts from old radios and other equipment. Readers should consult the final chapter for suggested modifications of the transmitter unit.

The proof of performance measurements determined by Cecil Lynch, radio engineer, are quite encouraging, and an exact copy of his report as given to KRJC on December 9, 1950, follows:

RADIO STATION KRJC - MODESTO, CALIFORNIA

AUDIO FREQUENCY PROOF OF PERFORMANCE MEASUREMENTS

November, 1950

Engineer: Cecil Lynch

.....

S U M M A R Y

Frequency Response:

Maximum permissible deviation between 100 and 5000 cycles (reference: 1000 cycles). . . . . 2.0 db

Measured maximum deviation . . . . . 0.5 db

Harmonic Distortion:

Maximum permissible, 0-84% modulation* 5.0%
Maximum permissible, 85-100% modulation* 7.5%

Measured maximum, at 5 input-grid volts. 1.2%

Carrier Shift:

Maximum permissible, at 100% modulation. 5.0%

Measured, at 5 input-grid volts. 0.9%

Carrier Hum and Extraneous Noise:

Maximum permissible. . . . . -50 db

Measured . . . . . -60 db

*at fundamental frequencies of 50, 100, 400, 1000, 5000, and 7500 cps.

Maximum permissible values are those specified by the FCC for AM Broadcast Stations, from microphone input to transmitter output. Above measurements are of transmitter only.

(continued)

AUDIO FREQUENCY PROOF OF PERFORMANCE MEASUREMENTS
(Continued)

For purposes of comparison, there is tabulated below the specifications of RCA Transmitter Type BTA-250L, and the measurements of the KRJC transmitter.

Function	RCA	KRJC
Carrier Shift (zero to 100% Modulation)	Less than 5%	0.9%
Carrier Noise and Hum Level (unweighted below 100% Modulation)	60 db	60 db
Audio Frequency Response (30 to 10,000 cycles)	plus-or-minus 1.5 db	plus-or-minus 3.0 db*
Audio Frequency Harmonic Distortion (50 to 7500 cycles, 0 to 95% Modulation)	not-to-exceed 3.0%	1.2%**

* KRJC is plus-or-minus 1.5 db from 50 to 10,000 cycles.

** At Normal Operating Level.

PROOF OF PERFORMANCE MEASUREMENTS (Continued)

KRJC TRANSMITTER DISTORTION AND NOISE - NOVEMBER, 1950

Noice: -60 db down from 80 cycles at 20 v. on 6SN7 grid.

DISTORTION

Frequency	5 volt level	30 volt level
30	2.2%	32.0%
50	1.2	22.0
80	0.7	19.0
100	0.6	13.5
150	0.5	6.8
200	0.4	4.2
400	0.4	2.4
600	0.4	2.3
1,000	0.4	2.5
1,500	0.4	2.5
2,000	0.4	3.0
3,000	0.6	6.8
4,000	0.6	15.0
6,000	0.5	20.0
10,000	0.4	28.0

Frequency of 80 cycles at various input levels:

5 volt	0.7%
10 volt	1.0
15 volt	3.0
20 volt	4.8
30 volt	19.0

Input at 20 volts to 6SN7 grid:

1,000 cycles	1.4%
10,000 cycles	13.0%

Note: Operating level should not exceed approximately 15 volts across the 6SN7 grid, for best distortion and frequency characteristics.

PROOF OF PERFORMANCE MEASUREMENTS (Continued)

KRJC TRANSMITTER FREQUENCY RESPONSE - NOVEMBER, 1950

(Level established with 5 volts on 6SN7 grid)

Frequency	Response
30	-3.0
40	-2.0
50	-1.5
70	-1.0
100	-0.5
200	-0.1
1,000	0
2,000	0
4,000	+0.5
6,000	+1.0
7,500	+1.5
10,000	+1.0
11,000	0
13,000	-1.0
15,000	-2.0
17,000	-3.0
20,000	-3.0

(Level established with 30 volts on 6SN7 grid)

Frequency	Response
30	-11.0
40	- 8.0
45	- 7.0
55	- 6.0
60	- 6.0
70	- 4.0
90	- 3.0
100	- 2.2
150	- 1.0
200	- 0.2
1,000	0
2,000	0
3,800	- 0.5
4,300	- 1.0
5,000	- 2.0
7,500	- 5.0
15,000	- 8.0

PROOF OF PERFORMANCE MEASUREMENTS (Continued)

KRJC TRANSMITTER FREQUENCY RESPONSE - NOVEMBER, 1950

(Modulator alone, loaded with 10,000 ohm resistor and at 30 volts across terminals

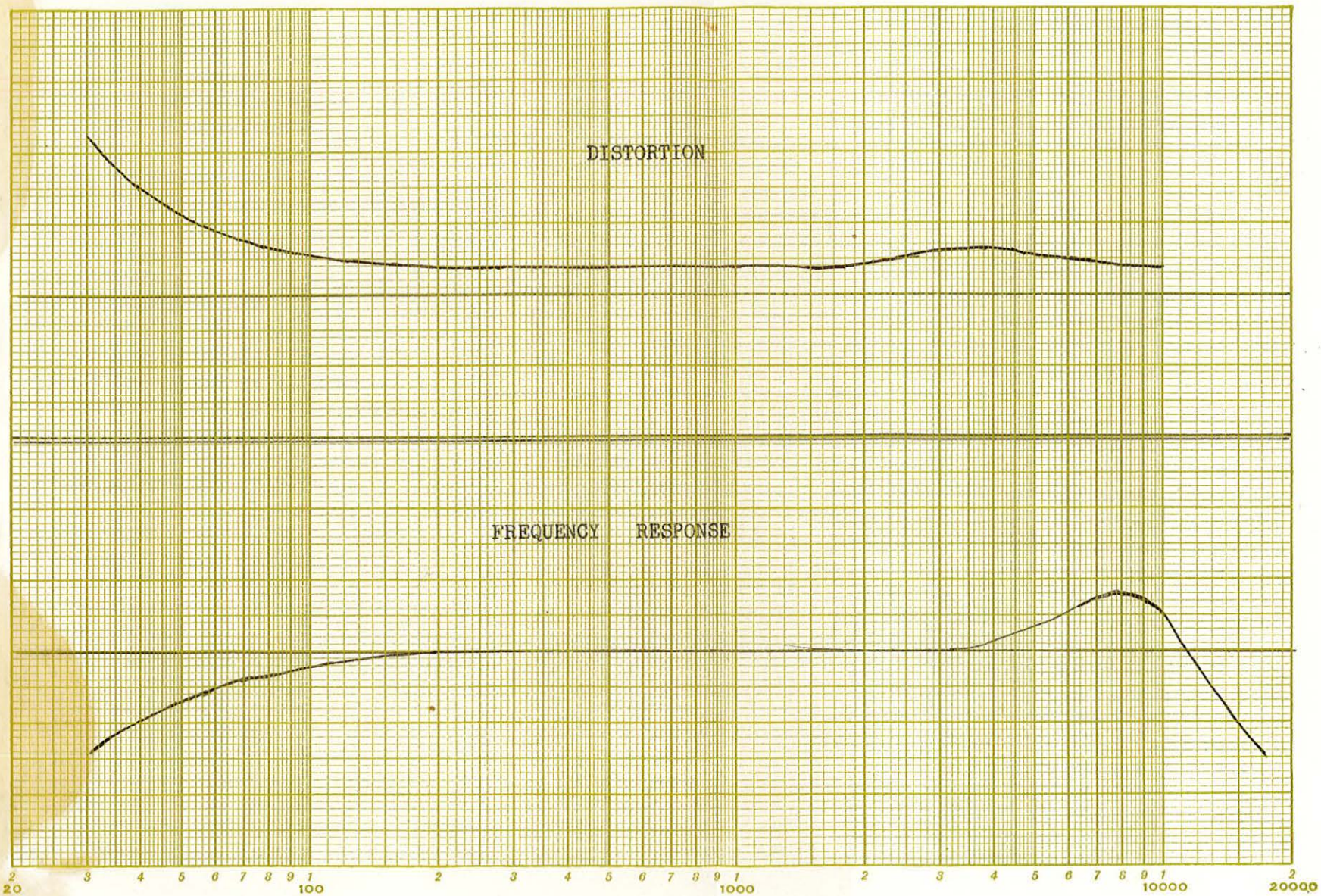
Frequency	Response
19.5	-3.0
23	-2.0
28	-1.0
45	-0.5
100	-0.1
200	0
1000	0
2000	0
20000	0

(With RF load - 30 volts modulator output)

30	-4.0
40	-2.0
50	-1.0
100	-0.2
200	0
1000	0
2000	0
5000	0
10000	0
17000	-1.0

In the above tests, the modulator was driven directly by the audio oscillator.

359-46G KEUFFEL & ESSER CO.
Audio Frequency–Semi-Logarithmic
Log Scale 20 to 20000 on long side × 10 to the half inch
5th lines accented.
MADE IN U. S. A.



FREQUENCY IN CYCLES PER SECOND

KRJC TRANSMITTER - NOVEMBER, 1950

FIGURE VII

The proof of performance measurements as submitted by engineer Lynch indicate that the KRJC transmitter is truly a high fidelity unit.

For AM transmitters the FCC allows a maximum deviation of ± 2.0 db. (decibles) on frequencies between 100 and 5000 cycles. The KRJC transmitter showed a deviation of only 0.5 db. over this frequency range. The KRJC transmitter compares very favorably in frequency response to the RCA 250 watt Transmitter Type BTA - 250L. A comparison of these transmitters is given in tabular form in the engineer's report, and it shows that the KRJC unit has a very slight deficiency in low frequency response below 50 cycles. Between 50 cycles and 10,000 cycles the college transmitter and the RCA Type BTA - 250L show nearly equal frequency performances. At 30 cycles the KRJC unit is down 3 db. which is quite satisfactory. On the high frequencies the KRJC transmitter is excellent. It is down only 1.0 db. at 13,000 cycles, 2 db. at 15,000, and 3 db. at 20,000.

The FCC allows a maximum harmonic distortion of 5.0 per cent on 0--84 per cent modulation, 7.5 per cent on 85 --100 per cent modulation. The specifications on the RCA transmitter call for audio frequency harmonic distortion on frequencies between 50 and 7500 cycles and with 0--95 per cent modulation not-to-exceed 3.0 per cent. The excellent qualities of the KRJC transmitter are clearly seen by comparison with the RCA unit and by study of the harmonic

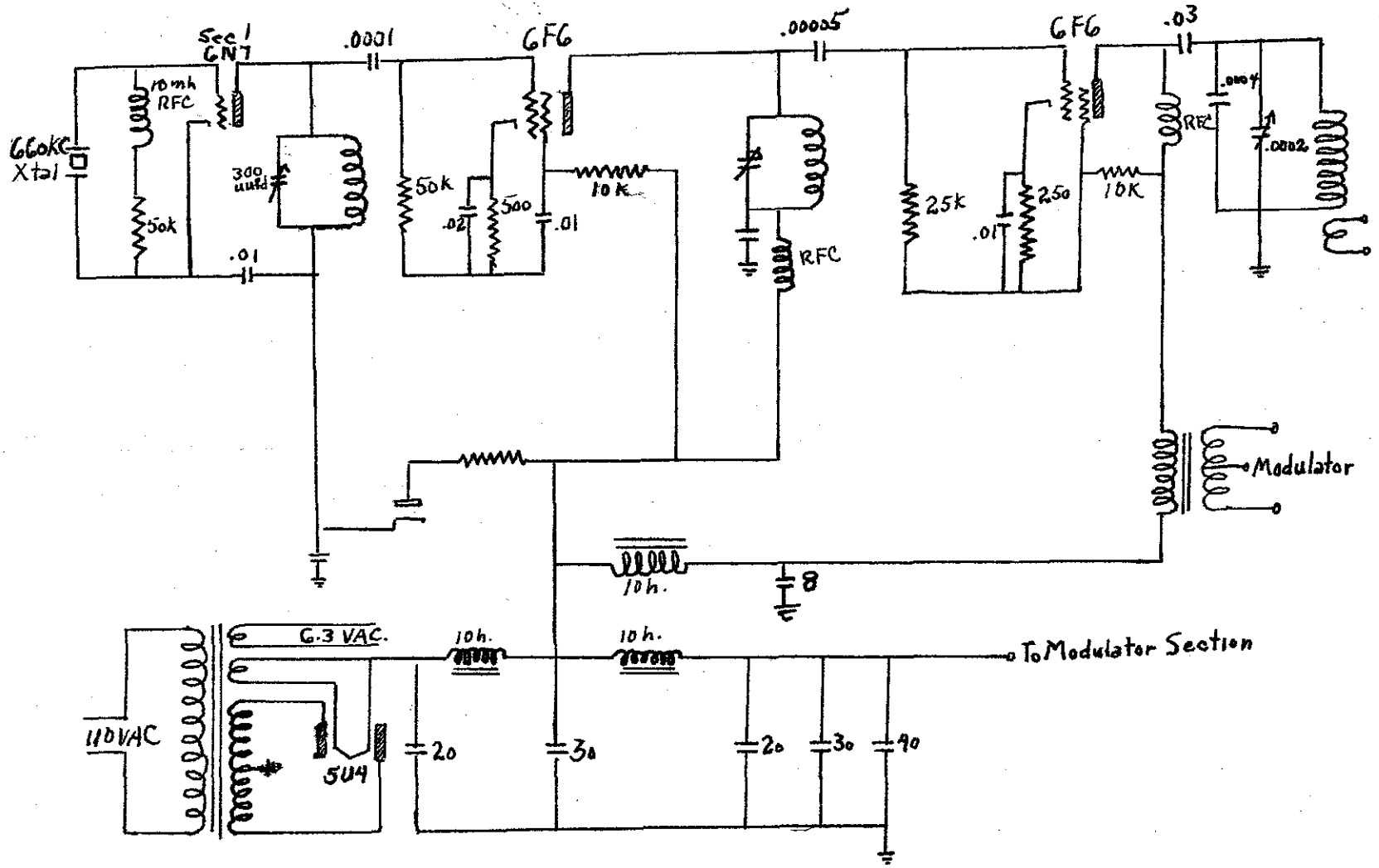
distortion curve in the engineer's report. On normal operating level and on frequencies between 50 and 7500 cycles, the college transmitter has a maximum distortion of 1.2 per cent.

A carrier shift of 5.0 per cent at 100 per cent modulation is allowed by the FCC, and the RCA transmitter shows this percentage of shift at 100 per cent modulation. KRJC shows a carrier shift of 0.9 per cent at normal operating levels.

The FCC regulations allow for carrier hum and extraneous noise level to be not more than -50 db. The specifications for the RCA BTA-250L call for carrier hum and extraneous noise of -60 db., and the KRJC transmitter measured -60 db. The maximum permissible values set by the Commission for AM Broadcast Stations are measured from microphone input to transmitter output. The measurements on KRJC are for the transmitter only; the specifications for the 250 watt RCA are for the transmitter only.

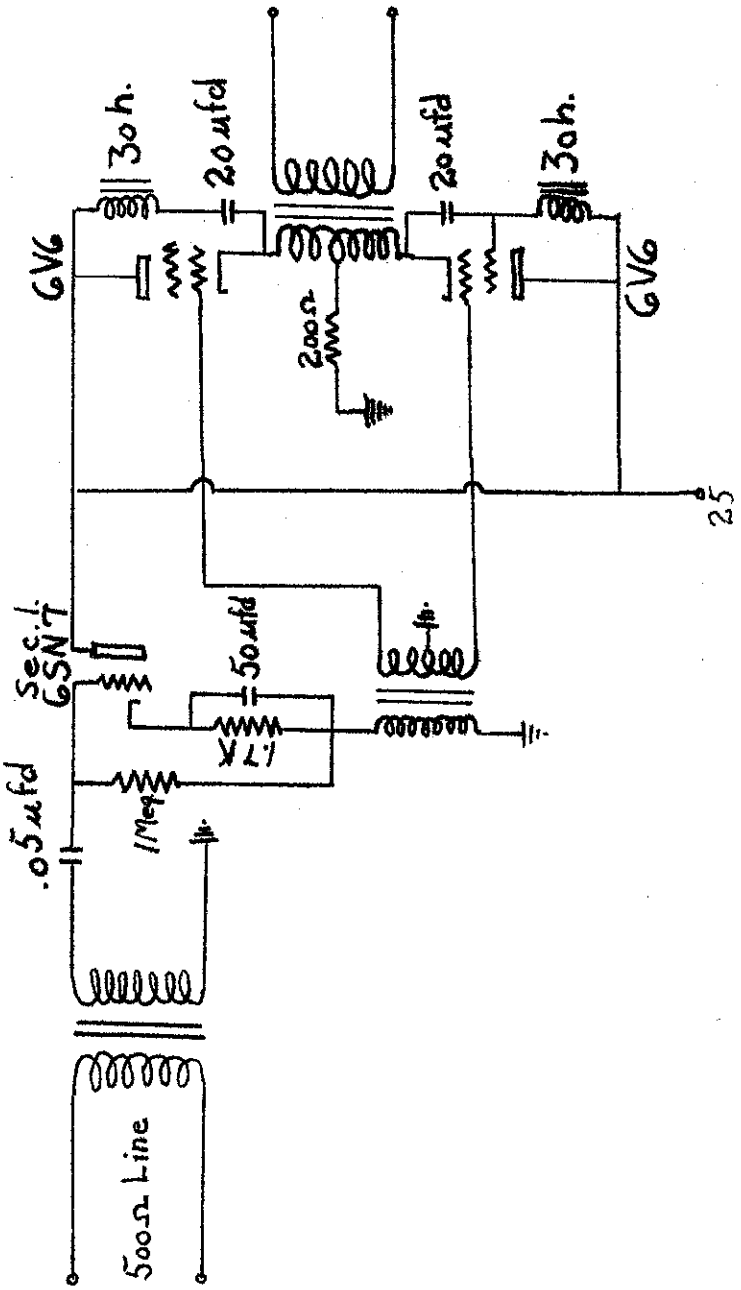
The KRJC radio frequency section and power supply is shown in the schematic drawing which appears in Figure VIII, page 79. The schematic drawing for the modulator section is shown in Figure IX, page 80.

Table V, page 81, shows a complete list of parts needed for the construction of the transmitter, modulator and power supply. The list also includes the net prices, manufacturers, catalog numbers and pages for all parts.



KRJC RADIO FREQUENCY SECTION AND POWER SUPPLY

FIGURE VIII



KRJC TRANSMITTER, MODULATOR SECTION

FIGURE IX

TABLE V

LIST OF PARTS NEEDED FOR THE CONSTRUCTION OF TRANSMITTER, MODULATOR AND POWER SUPPLY

Part	Quantity	Manufacturer and Model No.	Catalog No.	Catalog Page	Price Each	Total Cost
Modulation Transformer	1	UTC S18	62-771	80	4.90	
Interstage Transformer	1	Stancor A73C	64-083	76	1.88	
Input Transformer	1	UTC LS10	62-829	81	14.70	
Power Transformer	1	Stancor P6013	64-114	76	5.03	
Filter Choke 10h, 100ma	3	Stancor C-1001	64-057	76	2.18	6.54
Filter Choke	2	Stancor C-1515	64-058	76	1.06	2.12
Condensers RF and Power Supply						Type
C_1 .01 ufd 400V.DC		Sprague Black Beauty (pastic tube)	15-125	72	.15	TM-11-4
C_2 .0001 W.V.DC		Mica Aerovox	13-073	69	.12	1468
C_3 .02 ufd		Sprague Black Beauty (plastic tubular)	15-126	72	.15	TM-12-4

NOTE: The information on this list comes from Catalog Number 124 for the year 1951 of the Allied Radio Corporation, 833 West Jackson Boulevard, Chicago 7, Illinois.
All prices are net: wholesale.

TABLE V (Cont'd)

Part	Manufacturer and Model No.	Catalog No.	Type	Price Each	Catalog Page
C_4 and C_5 .01 ufd	Sprague Black Beauty (plastic tubular)	15-125	TM-11-4	.15	72
C_6 .00005 ufd	Molded Mica	14-103	(5W)5Q5	.12	71
C_7 .0001 ufd 400 V.DC	Aerovox Mica	13-073	1468	.12	69
C_8 .03 ufd	PTE "Blue Cub" (plastic tubular)	14-811	1653	.35	70
C_9 .0004 1000V.DC	Molded Mica	14-108	(5W)5T4	.15	71
C_{10} 20 ufd 400 W.V.DC	Br "Blue Beaver" (tubular dry electrolytic)	14-015	2045A	.88	70
C_{11} 30 ufd 400 W.V.DC	Br "Blue Beaver" (tubular dry electrolytic)	14-016	3045A	.97	70
C_{12} 20 ufd 400 W.V.DC	Br. "Blue Beaver" (tubular dry electrolytic)	14-015	2045A	.88	70
C_{13} 30 ufd 400 W.V.DC	Br "Blue Beaver" (tubular dry electrolytic)	14-016	3045A	.97	70
C_{14} 40 ufd 400 W.V.DC	Br "Blue Beaver" (tubular dry electrolytic)	14-017	4045A	1.18	70

TABLE V (Cont'd)

Part	Manufacturer and Model No.	Catalog No.	Type	Price Each	Catalog Page
C_{15} 40 ufd	Br "Blue Beaver" (tubular dry electrolytic)	14-017	4045A	1.18	70
C_{16} 300 uufd	Hammarlund General Purpose	72-437	MC325-M	4.23	90
Modulator Section					
C_{17} .05 ufd	PTE "Blue Cub" (plastic tubular)	14-682	455	.18	70
C_{18} 50 ufd	Br "Blue Beaver" (tubular dry electrolytic)	14-063	502A	.56	70
C_{19} 20 ufd 400	UP Electrolytic	14-407	2045	1.06	71
C_{20} 20 ufd	UP Electrolytic	14-407	2045	1.06	71
Resistors RF and Power Supply					
R_1 50000 Ω $\frac{1}{2}$ w	Knight insulated carbon resistor	1-820		.05	65
R_2 50000 Ω $\frac{1}{2}$ w	Knight insulated carbon resistor	1-820		.05	65

TABLE V (Cont'd)

Part	Manufacturer and Model No.	Catalog No.	Price Each	Catalog Page
R_3 10000 Ω 1 w.	Knight insulated carbon resistor	1-840	.06	65
R_4 500 Ω ½ w.	Knight insulated carbon resistor	1-820	.05	65
R_5 25000 Ω ½ w.	Knight insulated carbon resistor	1-820	.05	65
R_6 250 Ω ½ w.	Knight insulated carbon resistor	1-820	.05	65
R_7 10000 Ω ½ w.	Knight insulated carbon resistor	1-820	.05	65
R_8 10000 ww.	IRC Wire Wound	1-120	.54	63
Modulator Section				
R_9 1 meg ½ watt	IRC Wire Wound	Type B+S 1-000	.10	62
R_{10} 1,700 ½ watt	IRC Wire Wound	1-000	.10	62
R_{11} 200 10 watts	IRC Wire Wound	1-120	.44	63

TABLE V (Cont'd)

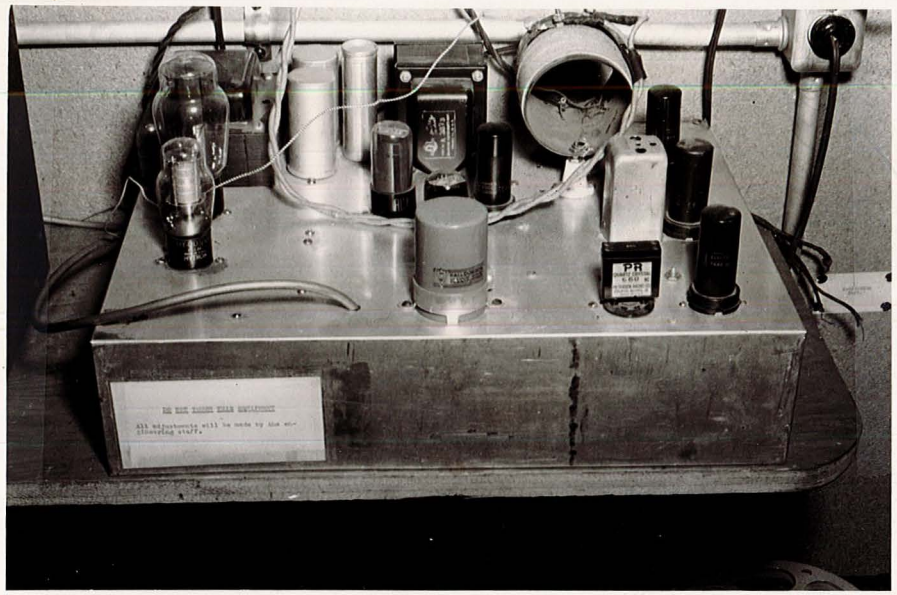
Part	Quantity	Manufacturer and Model No.	Catalog No.	Catalog Page	Price Each	Total Cost
RF coil	4	Standard 14-1005	60-006	85	.84	3.36
5U4 Tube	1	RCA	none	34	.87	.87
6F6 Tube	2	RCA	none	34	1.06	2.12
6N7 Tube	1	RCA	none	34	1.27	1.27
6SN7 Tube	1	RCA	none	35	1.16	1.16
6V6 Tube	2	RCA	none	35	1.69	3.38
The final output coil must be wound by the builder of the transmitter. Use a coil frame about 6" long by 4" to 5" in diameter. Cost of materials about two dollars.						2.00
The transmitter crystal may be purchased from the Peterson Radio Company, Council Bluffs, Iowa. Cost about ten dollars.						10.00
					Grand total cost	75.38

NOTE: All of the information on this list, with the exception of the last two items, comes from Catalog Number 124 for the year 1951 of the Allied Radio Corporation, 833 West Jackson Boulevard, Chicago 7, Illinois. All prices are net: wholesale.

Figures X and XI show photographs of the transmitter, modulator and power supply. The compactness of the unit is shown by the size of its case: $17\frac{1}{16}$" x $13\frac{1}{4}$" x $4\frac{1}{8}$". The layout of the transmitter parts can be rather easily seen in the photographs.

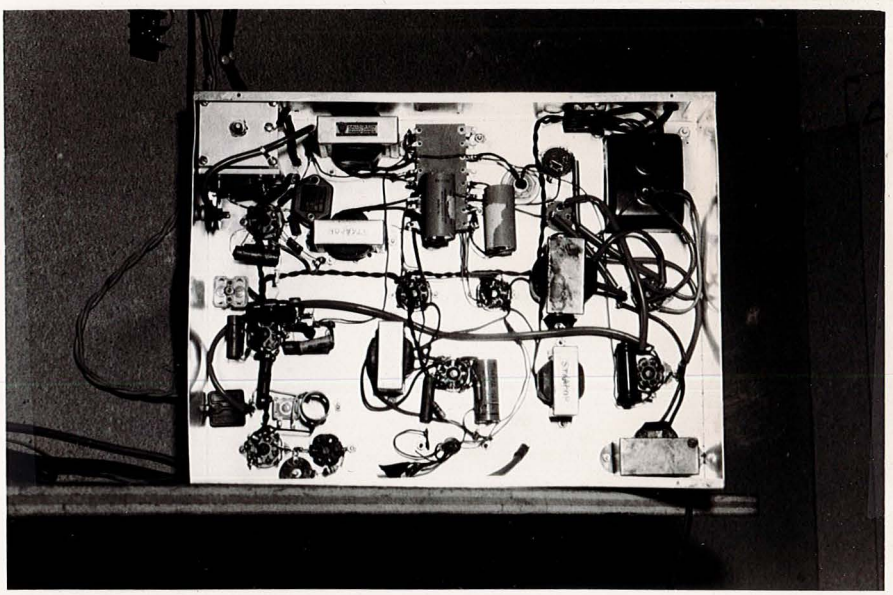
THE SYSTEM OF RADIO FREQUENCY DISTRIBUTION

The radio frequency signal from the KRJC transmitter is carried by a twisted pair line to the fuse box in the library building, a distance of about sixty feet from the transmitter. At this point, the radio frequency signal is capacity fed into the power (lighting circuit) of the building. The feeding of the signal into the circuit at this point results in excellent signal strength in the library building and in North Hall. The same twisted pair line feeds radio frequency energy into a line of the college intercommunication system. The intercommunication system has a main switch board in South Hall and lines going to most of the buildings on the campus. Some of the lines are overhead; others in a lead cable which is underground. Radio frequency signal is taken from the intercommunication line in the gymnasium and fed into the electric circuit in that building. An overhead twisted pair line carries the transmitter signal from the transmitter to the electricity shop, and at that point the signal is fed into the power lines. Another twisted pair runs overhead to



Case is $17\frac{1}{16}$" x $13\frac{1}{4}$" x $4\frac{1}{8}$"

FIGURE X



KRJC TRANSMITTER - COMPLETE

FIGURE XI

the college apartments. The three apartment buildings have a common power supply and the coupling into one building provides for good signal in all buildings. The apartment is about 150 feet from the transmitter.

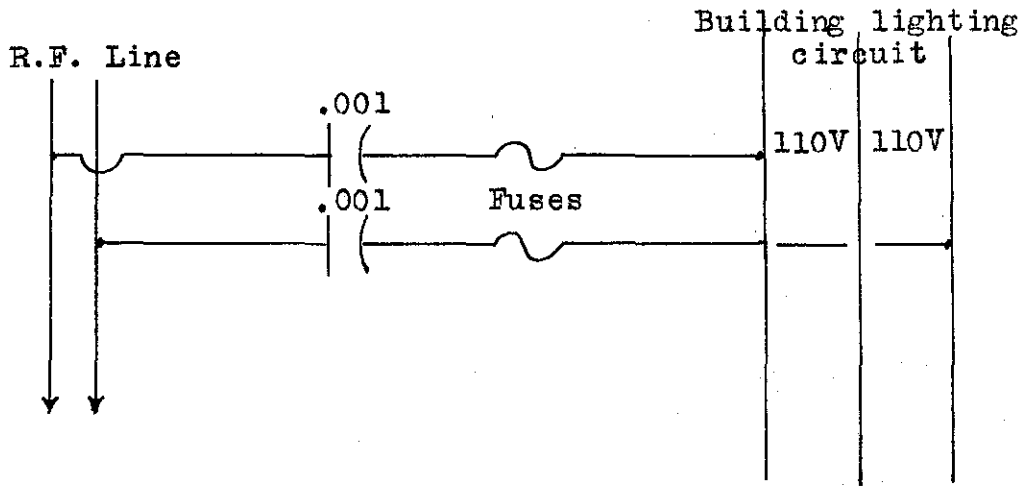
The KRJC signal strength is fair to poor in the buildings other than the library, North Hall, the apartments and the trailers. The system of feeding the radio frequency signal should be restudied. It is believed that a system of radio frequency amplification in at least two, but more probably three, locations will prove to be necessary.

A map of Modesto Junior College, which appears in the Appendix on page 110, shows the wire lines which carry radio frequency energy from the transmitter to the buildings of the college.

The KRJC method of feeding radio frequency energy into the electrical light circuit of a building is shown by the drawing in Figure XII, page 89, and the photograph of Figure XIII, page 90, also shows the method of feeding the radio waves into the lighting circuit.

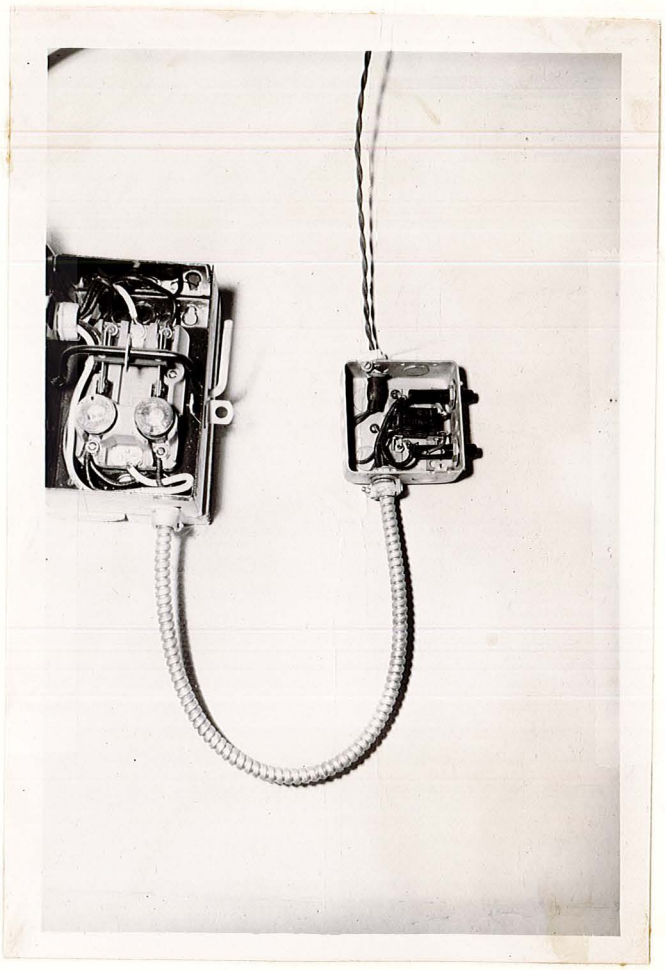
THE MONITORING SYSTEM

The audio frequency lines of the station allow for remote programs from the following places: the college auditorium in North Hall, the Outdoor Theater, the tennis courts, the football stadium and the baseball field.



RADIO FREQUENCY COUPLING
TO BUILDING LIGHTING CIRCUIT

FIGURE XII



Radio Frequency Coupling

to Lighting Circuit

FIGURE XIII

The amplifier section of a Scott radio receiver is used as a monitor amplifier. (A new high fidelity amplifier was installed in March, 1951.)

A twenty-five tube high fidelity Scott radio receiver is used for station monitoring and general radio listening in the main studio. This set covers the AM band and all of the short wave bands. The Freed radio, The Educator, which covers AM and FM is used for control room monitoring and the rebroadcasting of KCVN. On occasion this radio is also used for in-class listening; the set has given excellent results on FM, fair results on AM. The station has purchased a Zenith Major, FM only, to be used for the rebroadcasting of KCVN. Tests have indicated that the performance of this set will be excellent. A small portable AM set made by Setchell Carlson and operating on AC or battery is used for station monitoring on remote broadcasts and for spot reception tests on the campus.

PRODUCTION EQUIPMENT

The KRJC sound truck is comprised of two cabinets, each of which is mounted on four large four-inch casters. The turntables and amplifier are located in the larger cabinet which measures 50 inches by 26 inches by 42 inches in height. The smaller cabinet is one-half the length of the larger and it houses an eight-inch speaker. Three turntables and three pickup arms are now installed, and another

pickup arm is planned for the future. Two of the turntables are three speed: 33 1/3, 45, and 78 RPM; the other turntable is dual speed: 33 1/3 and 78. The middle pickup arm is located in such a position as to enable it to play records on the left or the middle turntables; the right pickup will play records on the middle or right turntables. The sound truck uses dual "pots" for pickup volume controls; alternating pickups are connected to one pot. In this way the pot is closed when the arrow points to twelve o'clock and a movement clockwise opens one pickup; a movement counter-clockwise opens another pickup. The sound truck does not have a master control. The speaker cabinet uses the bass reflex principle.

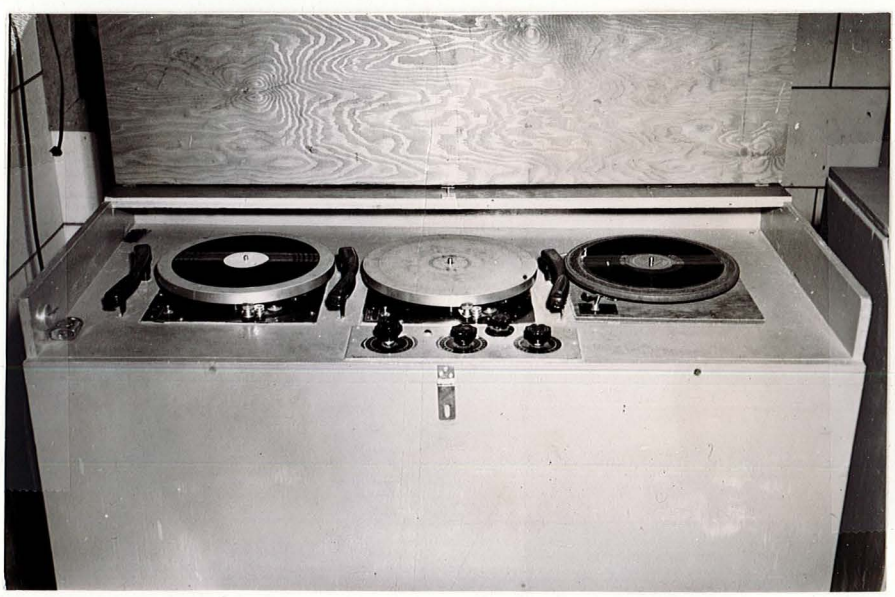
The photographs, Figures XIV and XV, of the sound truck show its layout and appearance; the block diagram, Figure XVI on page 94, shows its very basic operation.

The master mixer used in the control room of the station provides for four microphone inputs, two turntable inputs, and one remote channel input. The unit is high impedance and employs high level mixing. The line amplifier has two outputs: two five hundred ohm telephone line outputs which go to the transmitter and KTRB-FM, and one high impedance output which goes to the audio monitor amplifier.

The photographs, Figures XVII and XVIII on page 95, and the drawing of the mixer, Figure XIX on page 96, show the functional layout; the block diagram, Figure XX on

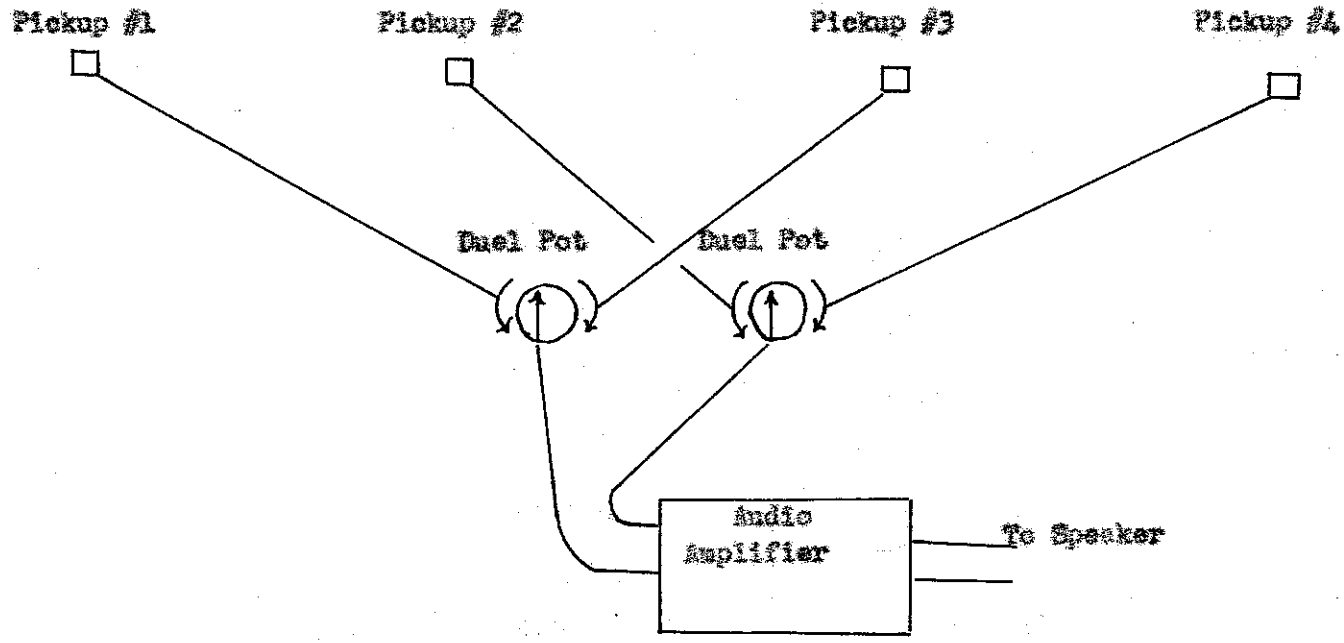
42" x 50" x 26"

FIGURE XIV



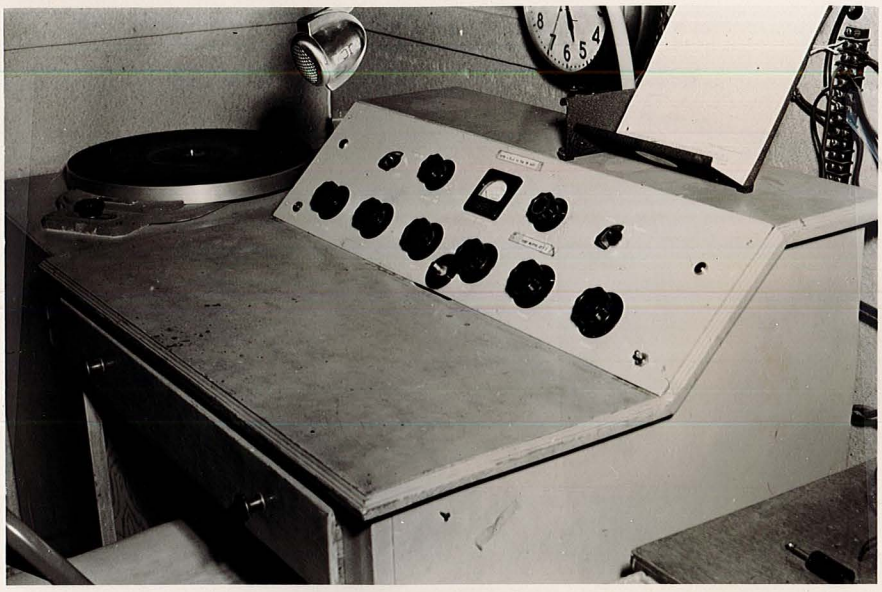
SOUND TRUCK

FIGURE XV



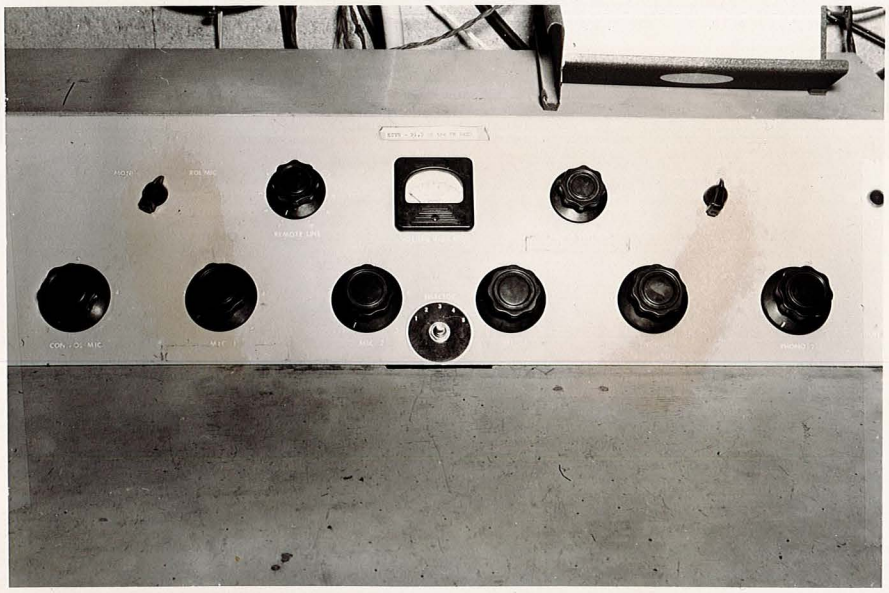
BLOCK DIAGRAM OF SOUND TRUCK

FIGURE XVI



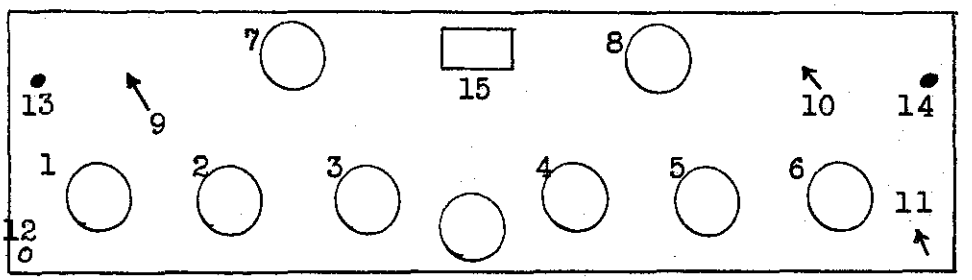
MASTER MIXER

FIGURE XVII



MASTER MIXER PANEL

FIGURE XVIII



MASTER MIXER PANEL

1, 2, 3, 4. Microphone inputs

5, 6. Turntable inputs

7. Remote line

8. Master control

9. Control mike switch

10. Turntable cue switch

11. Power switch

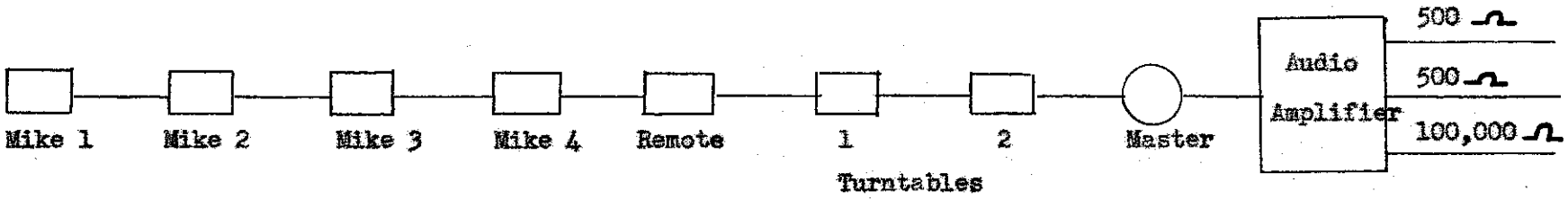
12. Earphone plug jack

13. Control mike light (green)

14. Power light (amber)

15. Volume indicator

FIGURE XIX



BLOCK DIAGRAM OF MASTER MIXER

FIGURE XX

page 97, shows the very basic operation.

The two turntable units used in the control room are housed in plywood cabinets which measure 21½ inches square at the top and bottom and 28½ inches high. The cabinets are constructed of 3/4-inch angle iron frames with 1/4-inch plywood on the sides, 3/4-inch plywood on the top and nothing on the bottom. The turntables are RecOKut Model G2. The Livingston Transcription Arm, Model A-16, uses a Leartron high fidelity Model MD 103 Magnetic pickup cartridge. The performance of this installation has been very satisfactory.

The RCA, Model 77D, polidirectional microphone is used for musical programs and as a cast microphone in dramatic programs. Occasionally this microphone is used for discussion programs. The variable adjustments on this microphone have proved to be very convenient. The RCA, Model 74B, microphone is used for sound effects, and occasionally as a cast microphone. The Western Electric, Model 633A, Saltshaker is used for all types of talk shows; newscasting, discussion, remotes, and sportscasting. The Turner crystal microphones, Model 33X, are used in the control room and will be used for remote talk shows when a new remote amplifier, now under construction, is completed.

Tape recording is done by the Brush Soundmirror Model BK-401 and the portable Magnecorder Model PT6-P.

The mixer-amplifier section of the Magnecorder serves as an excellent three-channel remote unit.

21½" x 21½" x 28½"

TURNTABLE

FIGURE XXI

CHAPTER VI

SUMMARY OF FINDINGS AND RECOMMENDATIONS

The many facts brought to light by this study of KRJC would appear to have value to Modesto Junior College and to those people interested in the development of campus radio stations employing the carrier-current principle. To facilitate the findings of this study, the most important facts are summarized in the following paragraphs. This summary is followed by a list of recommendations for the improvement of all phases of KRJC.

SUMMARY OF FINDINGS

1. The very basic principle of electromagnetic induction makes carrier-current transmission possible.

2. Because of the radiation regulations of the FCC, campus stations should, if possible, select frequencies at the low end of the broadcast band.

3. The FCC does not inspect installations and transmission of campus stations at the request of the station.

4. The FCC does not issue a certificate for the operation of a campus station.

5. The FCC does register the call letters of campus stations.

6. Personnel working on campus stations do not require radiotelephone or radiotelegraph licenses of any type.

7. There has been a considerable, but rather slow, expansion of radio courses at Modesto Junior College since their introduction to the college curriculum in 1936.

8. Following the demands for advancement in the broadcasting industry, the Modesto Junior College radio curriculum has been organized to permit and encourage the continuation of academic work in a senior college.

9. The introduction of professional radio equipment at the college has given radio students the opportunity to study and use the basic tools of the broadcasting industry.

10. Efficient procedures and organization have been developed by KRJC.

11. The KRJC hookboard is serving a definite need.

12. The KRJC plant is seriously limited by lack of adequate floor and storage space and electrical outlets.

13. KRJC has used many sources of publicity: the college weekly newspaper, The Collegian; station call letters in many locations; KTRB-FM; letters to students and faculty; the personal contacts of station personnel with students and faculty; and the daily bulletin of the college.

14. At the start of KRJC operations on January 23, 1950, the programming structure depended too much on KCVN.

15. KRJC has used fifteen sources of radio programs.

16. The cooperation of the KTRB Broadcasting Company has been of great assistance to KRJC.

17. KRJC started programming KTRB-FM for two hours nightly on March 13, 1950.

18. KRJC started the presentation of its own news broadcasts from UP and INS on May 15, 1950.

19. The KRJC audience survey reached 77.6 per cent of the groups living on the campus.

20. The audience survey showed that the average number of hours spent listening to the radio was 4.2 for those living on campus. Radio listening varied from fifteen minutes to fifteen hours.

21. Campus listeners like popular music programs most and opinion programs least.

22. About 94 per cent of the roommate groups have radios.

23. The survey shows most groups listen between 7 and 8 P.M., least between 8 and 9 A.M.

24. The survey shows a tremendous difference in program preferences.

25. KRJC is being used for in-class listening in many subject matter fields.

26. The results of the students' evaluations of the Campus Mirror program are encouraging.

27. The parts used in the KRJC transmitter, modulator and power supply are inexpensive and are of the quality type generally used by amateur radio operators.

28. The proof of performance measurements as submitted by engineer Lynch indicate that the KRJC transmitter is truly a high fidelity unit.

29. The KRJC transmitter performance compares very favorably with the professional model 250 Watt RCA Type BTA-250L.

30. The total cost of all components needed for the construction of the transmitter, modulator and power supply is, on February 1, 1951, $75.38.

31. The radio frequency signal of the transmitter is capacity fed into the electric lighting system on the college campus.

32. The signal of the station is very good in the library building, North Hall and the apartments; the signal is fair to poor on other locations on the campus.

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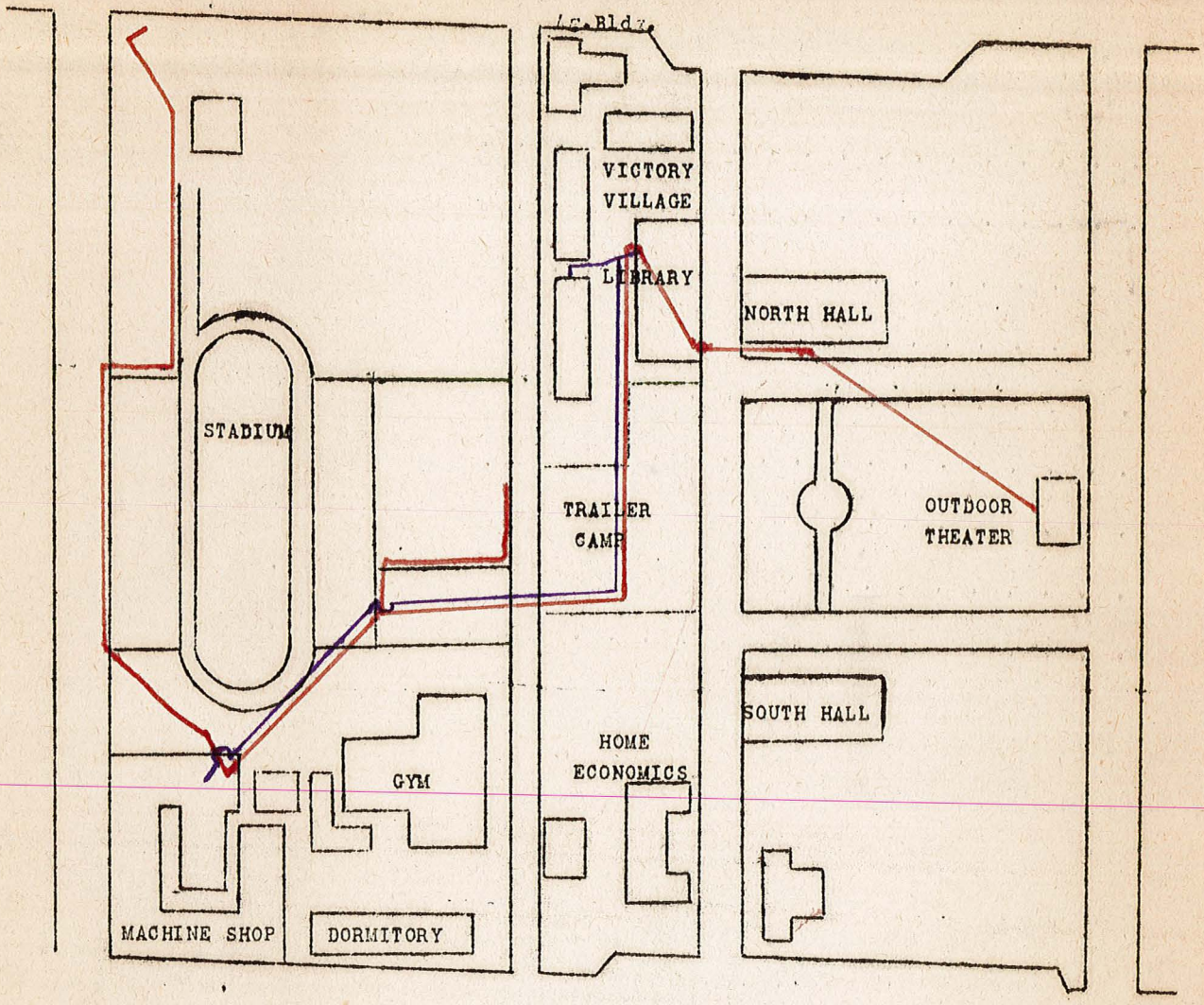
APPENDIX

MAP OF THE MODESTO JUNIOR COLLEGE CAMPUS



Radio frequency lines

Audio frequency lines

KRJC

MODESTO JUNIOR COLLEGE
Modesto, California Phone 6182-W

DIRECTOR
d McClarty

ION MANAGER
eorge Everett

RAM DIRECTORS
eman Johnson
Ed Smith

IEF ENGINEER
Jack Brooks

ICITY DIRECTOR
Leo Petersen

SIC DIRECTOR
Jim Powell

ECIAL EVENTS
Bill Leach

K R J C is registered with the Federal Communications Commission, Washington D. C.

K P I C
PRODUCTION REPORT

Quality legend:
I - inferior
P - poor
F - fair
G - good

I.D. legend:
C - correct
I - incorrect
O - omitted

Date _____

P. M. _____

No.	PROGRAM	QUALITY Pro.	QUALITY Eng.	I.D.	REMARKS*
(1)					
(2)					
(3)					
(4)					
(5)					
(6)					
(7)					
(8)					

*Use back side of this sheet if necessary; indicate program number.

REPORT OF THE PRODUCTION MANAGER

Date _____

TO: KRJC Station Manager

A check mark after the following duties of the production manager indicates that the duty has been carried out to the best of my ability.

1. Read and understand the station log at least one hour before broadcast time. ☐
2. Check the program book for completeness and correct order. ☐
3. Arrange records, transcriptions, tapes, and other broadcast material in the best possible order for convenience and efficiency. ☐
4. Personally check or have one of the engineers check all equipment needed for the evenings broadcast. ☐
5. Check the correct time with Western Union after 4 P.M. but before 5:45 P.M. ☐
6. Check and adjust all clocks. ☐
7. Give complete cooperation and help to the board operator. ☐
8. KEEP ORDER IN THE STUDIO. THIS INCLUDES PHYSICAL OBJECTS AS WELL AS PEOPLE. ☐
9. After the broadcast schedule, be certain that all records are replaced, all equipment is turned off, and lock the following: ☐

   Control room door ____
   Sound truck ____
   Back room door ____
   Record and transcription case. ____

10. Fill out the production report. ☐

To the best of my knowledge, this report is complete and accurate.

_____

Production Manager

The board operator duting this shift was _____.

THE RADIO WORKSHOP, MODESTO JUNIOR COLLEGE

RADIO 48

Instructor:

Ed McClarty
1513 Del Monte Ave., Modesto
Phone:
home: 4251-R
KRJC: 6182-W
MJC: 1006

Members of the class:

Barnes, Coy
1406 Faustina, Modesto
Phone: 4394-J

Bertaut, John
Rt. 1, Box 639, Turlock
Phone: 2-2066

Brooks, Jack
Rt. 1, Box 545, Waterford
No Phone

Clark, Bill
Rt. 1, Box 265, Hughson
Phone: 83-F-5

Headley, Dave
405 North Street, Ceres
Phone: 57-J-11

Jackson, Leon
Rt. 1, Box 351, Denair
Phone: Turlock 4-4085

Keith, Virginia
306 Pine St., Modesto
Phone: 345-J

Leach, Bill
118 Orange Ave., Modesto
No phone

Mallea, Carmy
112 Hackberry Ave., Modesto
Phone: 7347-W

Mattes, Don
466 E. Alameda St., Manteca
Phone: Manteca 159-R

Radio Stations:

KTRB: 3926, 774, 775
KBEE: 26
KMOD: 382
KRJC: 6182-W
KCVN: Stockton 3-1449
KNBC: San Francisco,
Graystone 4-8700
KTUR: Turlock 4-3430
4-5827

Peterson, Leo
525 Semple, Modesto
3744-J

Raleigh, Rollin
801 East Avenue, Turlock
Phone: Turlock 4-4256

Siegman, Thomas
Rt. 8, Box 1068, Modesto
Phone: 20-J-2

Smith, Edwin
612 Ila Way, Modesto
Phone: 6603-W

Sugars, Ed
Delhi
No phone

Thomson, Don
628 Second St., Modesto
Phone: 2611-W
Todd,
Todd, Don
First and La Galina, Waterford
Phone: Waterford 4-351

Wilhite, Jackie
911 Sutter St., Modesto
Phone: 1037-J

Williams, Leonard
Apt. B-1, MJC, Modesto
No phone

Everett, George
219 Mariposa Ave., Modesto
Phone: 3944 J

(Do not fill in.)

R. W. R. No. _____

Request for Tape Recording

Date _____

From:

To: Ed McClarty--The Radio Workshop

If a radio program, fill out this column.

Name of show _____

Length of show _____

Station _____

Date _____

Day _____

Time _____

If class recording, fill out this column.

Brief description of material to be recorded:

Length of recording _____

Time _____

Date _____

Day _____

Place _____

DISPOSITION

Broadcast on KMJC

Day _____

Date _____

Time _____

Do not broadcast on KMJC

Describe use:

_____

_____

_____

_____

_____

NOTE:

Unless tapes are provided the tape must remain in the KMJC library, and will not be erased for a period of ten (10) days.

Week of _____, 1930

KRJC STUDIO SCHEDULE

HOUR	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
8:10-9					
9:10-10					
10:10-11					
11:10-12					
12 - 1					
1:10 - 2					
2:10- 3					
3:10 - 4					
4:10 - 5					
5:10 - 5:30					

K M J C

REQUEST FOR SPECIAL BROADCAST ....

IT IS REQUESTED THAT THE FOLLOWING SPECIAL BRAODCAST BE SCHEDULED:

1. Event _____

2. Date _____ 3. Time: from _____ to _____

4. Origin _____

5. Technical Equipment Required _____

_____

_____

_____

ALL PERSONNEL REQUIRED FOR THIS BROADCAST WILL BE PROVIDED BY THE DIRECTOR OF SPECIAL EVENTS.

SIGNED: _____
DIR. OF SPECIAL EVENTS

FACILITIES AVAILABLE: _____
CHIEF ENGINEER

APPROVED: _____
STATION MANAGER

COPIES:

1. Dir. of Special Events.
2. To Chief Engineer for approval
3. then Station Manager for approval, then (20 to Program Department and (3) to Engineer.

STUDENT'S REPORT OF A BROADCAST

Subject covered by the broadcast _____

Title of the program series _____

Radio Station K M J C Length of program _____ Date of broadcast _____ Time _____ day _____

DIRECTIONS: KMJC is very much interested in getting your opinion of the Campus Mirror program which you heard during one of your class periods. Hence, we would like your honest evaluation of this program. Please check (✓) those items which most nearly express your judgement of this program.

1. Did you find the subject of the program
   a. very interesting?
   b. interesting?
   c. slightly interesting?
   d. of no interest?

2. Do you believe the program itself was of
   a. great educational value?
   b. educational value?
   c. slight educational value?
   d. no educational value?

3. From the standpoint of your interest and attention was the broadcast
   a. too long?
   b. about right?
   c. too short?

4. To what extent did the program result in your increased interest in the subject under discussion?
   a. greatly
   b. some
   c. slightly
   d. none

5. To what extent did the program result in discussion with your classmates about the subject?
   a. greatly
   b. some
   c. slightly
   d. none

6. To what extent did the program result in discussion with your roommate about the subject?
   a. greatly
   b. some
   c. slightly
   d. none

7. To what extent did the program result in discussion with your family about the subject?
   a. greatly
   b. some
   c. slightly
   d. none

8. Would you have listened to this program at home on your own time?
   a. yes
   b. perhaps
   c. no

9. Do you believe the method of getting students' opinions for the program, Campus Mirror, is democratic?
   a. yes
   b. no

   If your answer to question number 9 is no, please give the reasons for your belief here.

10. Please use the remainder of this side and the back of this sheet to state what done to improve this programs.

"A Workshop in Educational Radio"

K J C

CASTING SHEET

TITLE OF SHOW . . . . . .

CALL FOR SCRIPT . . . . . STUDIO ENGINEER

REHEARSALS _____ _____

_____ _____

_____ _____

_____ _____

_____ _____

ON THE AIR TO BE RECORDED FOR KMJC FOR KTRB
FOR KMOD FOR KTUR (Circle all that apply)
FOR KBEE FOR KCVN

. . . . . .

_____

_____

	CAST	ROLE	O. K.
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			

_____

_____

SOUND _____ _____ DIRECTOR _____

_____ _____ NOTES _____

_____ _____

MUSIC _____ _____

_____ _____

The Radio Workshop, Modesto Junior College

K R J C

MEMORANDUM

To: Date _____

From:

Subject:

MESSAGE:

The Radio Workshop, Modesto Junior College

K R J C

MEMORANDUM

To: Date _____

From:

Subject:

MESSAGE:

K M J C

CASTING SHEET

TITLE OF SHOW . . . . . .

CALL FOR SCRIPT . . . . . STUDIO ENGINEER

REHEARSALS _____ _____

_____ _____

_____ _____

_____ _____

_____ _____

ON THE AIR TO BE RECORDED FOR KMJC FOR KTRB
FOR KMOD FOR KTUR (Circle all that apply)
FOR KBEE FOR KCVN

. . . . . .

_____

_____

	CAST	ROLE	O. K.
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			

_____

_____

SOUND _____ _____ DIRECTOR _____

_____ _____ NOTES _____

_____ _____

MUSIC _____ _____

_____ _____

KRJC

WEEKLY WORK REPORT - RADIO 47 & 48

NAME_____ WEEK OF _____

The following is an accurate account of the work I have undertaken during this school week:

Description of work	Day Date	Time spent on work Hours From	To

Total time_____

NOTE: Experience is priceless. Your workshop is designed to give you the opportunity to learn by doing. Take advantage of your opportunities to gain valuable experience now. On the job, you will not be paid to make mistakes.

PROGRAM LOG -- K R J C -- PROGRAM LOG

DAY _____ DATE _____, 195___

Name of operator	Time on	Time off	TRANSMITTER Time on	Time off

TIME	PROGRAM	SPOT ANNOUNCEMENT	START	END	ID	AOMR	ORIGIN

K T R B BROADCASTING COMPANY

Program and Commercial Log - K T R B and K T R B - F M

Page No. Date Operator

ULED | PERFORMANCE
IE | TIME

STATION BREAK---Spots:

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EVALUATION CHART FOR RADIO DRAMA

NAME OF PROGRAM _____ SERIES _____

TIME _____ STATION _____ SPONSOR _____

DIRECTOR _____

TYPE OF PRODUCTION: (Underline) Mystery, Comedy, Straight Drama, Fantasy, Documentary.

---

1. Describe opening routine of series. (List: Theme, announcer, music, etc.)

2. Time first three music transitions. 1. _____ sec. 2. _____ sec. 3. _____ sec

3. On the reverse side of this sheet, describe briefly, as a listener, one of the most effective scenes of the drama. Then, as a director, fill out the following chart for the scene:

CAST: _____ VOICE QUALITY: _____ NUMBER OF

_____ _____ MIKES

_____ _____ NEEDED:

_____ _____ _____

SOUND EFFECTS NEEDED: _____ MUSIC: _____

_____ _____

_____ _____

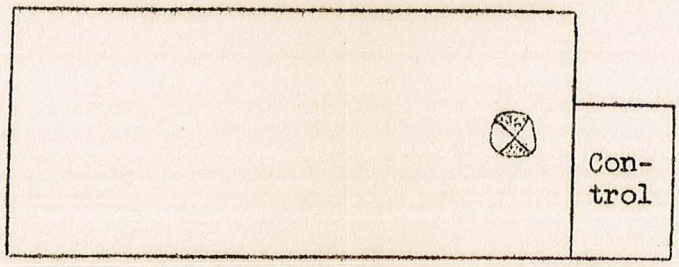
5. Were there noticeable changes in tempo throughout the play? _____

In pacing of actor's lines? _____ Music cues? _____ Sound? _____

6. On the diagram below, place in what you would consider their proper positions for the above scene all actors, sound men, musicians. Add microphones if necessary.

Draw microphones as below:

Shaded portions are live sides.



7. Were all sound effects in the show necessary? _____ Well Executed? _____

Were there any especially effective sound effects? _____

8. What device was used most frequently for transitions between scenes: Music?___

Sound? _____ Narrator? _____ Combination? _____

9. In music transitions did music end before first word of following scene? _____

   Was it faded under and out during the first few words of following scene? _____

   Did transition sometimes become mood music, held under narrator or scene? _____

10. If you were rating this show with stars, would you give it 4, 3, 2, or 1? Why? Answer on back of sheet, commenting on script, acting, sound, and music.

11. If the performance you heard was the dress rehearsal and you were the director, what changes, if any, would you make in the show? (Use back of sheet.)

RATING CHART OF ACHIEVEMENT IN RADIO ANNOUNCING

	inferior	poor	average	good	superior
COMMUNICATION OF IDEAS					
COMMUNICATION OF EMOTION					
PROJECTION OF PERSONALITY					
NATURALNESS					
VITALITY					
FRIENDLINESS					
ADAPTABILITY					
PRONUNCIATION					
VOICE CONTROL					
PITCH					
LOUDNESS					
TIME					
QUALITY					

Additional Comments:

Date _____ Observer _____

K R J C

MONITOR'S REPORT

I heard KRJC KTRB-FM a MJC radio workshop program on _____ (day), _____ (date), _____ (time).

Name of program:
Quality of production:
Quality of announcing:
Quality of writing:
Will you listen again?
Why?

Remarks:

K R J C

MONITOR'S REPORT

I heard KRJC KTRB-FM a MJC radio workshop program on _____ (day), _____ (date), _____ (time).

Name of program:
Quality of production:
Quality of announcing:
Quality of writing:
Will you listen again?
Why?

Reasons: